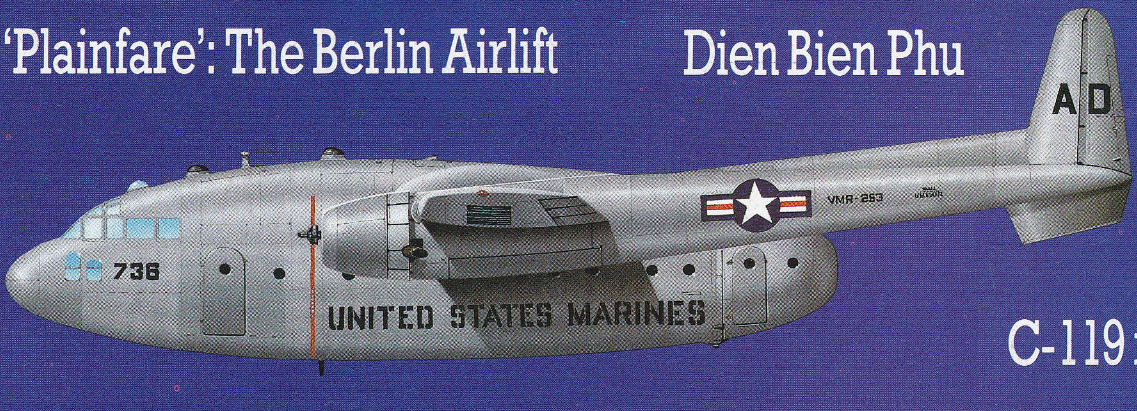
The world's most comprehensive encyclopedia of the military weapons of the 20th century

WAR MACHINE

An ORBIS Publication
90p 104
IR £1.15 Aus $2.15 NZ $2.65 SA R2.45 Sing $4.50

Operation 'Plainfare': The Berlin Airlift

Dien Bien Phu


AD
VMR-253
736
UNITED STATES MARINES

C-119 in Action

A fully illustrated guide to Post-War Transport Aircraft

WAR MACHINE

Volume 9 **Issue 104**

Published by
Orbis Publishing Ltd
© Aerospace Publishing Ltd 1985
Colour profiles, diagrams and cutaway drawings © Pilot Press Ltd

Editorial Offices
War Machine
Aerospace Publishing Ltd
179 Dalling Road
London W6 0ES

Managing Editor: Stan Morse
Editorial: Trisha Palmer
Chris Bishop
Chris Chant
Ian Drury

Design: Rod Teasdale
Colour Origination: Imago Publishing Ltd, Thame, Oxon

Typesetting: SX Composing Ltd

Film work: Precise Litho Ltd

Artists:
U. Hasegawa
Keith Woodcock
Frances Pitt

29858

Printed in Great Britain
by The Artisan Press Ltd

Subscription Manager: Christine Allen
0488 72666

Consultant Editor: Major General Sir Jeremy Moore KCB OBE MC, Commander of British Land Forces during the Falklands campaign.

Distribution and marketing offices:
Orbis Publishing Ltd
Orbis House
20-22 Bedfordbury
London WC2N 4BT
Telephone: 01-379 6711

Circulation Director: David Breed
Marketing Director: Michael Joyce

WAR MACHINE
Forthcoming issues feature:
Anti-Tank Guns of World War II
Modern COIN Aircraft
Axis Destroyers of World War II
Modern Mine Warfare Vessels
Air-to-Ground Weapons of World War II

Picture acknowledgements

Cover photograph: Jon Lake. **2061:** Jon Lake/MoD. **2062:** US Air Force/US Air Force. **2063:** RAF Museum, Hendon. **2064:** Austin J. Brown/US Air Force. **2065:** US Air Force/US Air Force. **2066:** US Air Force/US Air Force/US Air Force. **2067:** US Air Force/US Air Force. **2068:** US Air Force/US Air Force. **2069:** US Air Force. **2072:** US Air Force/US Air Force/US Navy. **2073:** MoD. **2074:** Royal Canadian Air Force. **2075:** MoD. **2077:** Robert Hunt Library. **2078:** Robert Hunt Library/Robert Hunt Library/Robert Hunt Library. **2079:** MoD. **2080:** Aviation Letter Photo Service.

HOW TO OBTAIN ISSUES AND BINDERS FOR WAR MACHINE

Issues can be obtained by placing an order with your newsagent or direct from our Subscription Department. If you have difficulty obtaining any back issues from your newsagent, please write to us stating the issue(s) required and enclosing a cheque for the cover price of the issue(s).

AUSTRALIA please write to: Gordon and Gotch (Aus) Ltd, 114 William Street, PO Box 767G, Melbourne, Victoria 3001. MALTA, NEW ZEALAND, SINGAPORE & SOUTH AFRICA: Back numbers are available at cover price from your newsagent. In case of difficulty, write to the address given for binders.

UK/EIRE
ISSUE PRICE: 90p/IR£1.15
SUBSCRIPTION:
6 Months: £26.00
1 Year: £52.00
BINDER: Please send £3.95 per binder, or take advantage of our special offer in early issues.

EUROPE
ISSUE PRICE: 90p
SUBSCRIPTION:
6 Months air: £44.72
surface: £36.14
1 Year air: £89.44
surface: £72.28
BINDER: (inc. Postage)
air: £5.50
surface: £5.00

MALTA
Obtain BINDERS from
your newsagent or
Miller (Malta) Ltd,
MA Vassalli Street,
Valetta, Malta
Price: £3.95

MIDDLE EAST
ISSUE PRICE: 90p
SUBSCRIPTION:
6 Months air: £50.18
surface: £36.14
1 Year air: £100.36
surface: £72.28
BINDER: (inc. Postage)
air: £8.25
surface: £5.50

AMERICAS/ASIA/AFRICA
ISSUE PRICE: US$1.95/90p
SUBSCRIPTION:
6 Months air: £59.24
surface: £36.14
1 Year air: £119.08
surface: £72.28
BINDER: (inc. Postage)
air: £9.50
surface: £5.50

SOUTH AFRICA
ISSUE PRICE: SA R2.45
Obtain BINDERS from
any branch of Central
News Agency or
Intermag, PO Box
57394, Springfield 2137

SINGAPORE
ISSUE PRICE: Sing$4.50
Obtain BINDERS from
MPH Distributors
601 Sims Drive
03-07-21
Singapore 1438

AUSTRALASIA/FAR EAST
ISSUE PRICE: 90p
SUBSCRIPTION:
6 Months air: £64.22
surface: £36.14
1 Year air: £128.44
surface: £72.28

AUSTRALIA
ISSUE PRICE: AUS $2.15
Obtain BINDERS from
First Post Pty Ltd,
23 Chandos Street
St Leonards,
NSW 2065

NEW ZEALAND
ISSUE PRICE: NZ $2.65
Obtain BINDERS from
your newsagent or
Gordon & Gotch (NZ)
Ltd, PO Box 1595,
Wellington

ADDRESS FOR BINDERS AND BACK ISSUES
Orbis Publishing Limited
Orbis House
20-22 Bedfordbury
London
WC2N 4BT
Telephone: 01-379-5211

Cheques/Postal Orders should be made payable to Orbis Publishing Limited. Binder prices include postage and packing and prices are in sterling.

Back Issues are sold at the cover price, and we do not charge carriage in the UK.

NOTE
Binders and back issues are obtainable subject to availability of stocks. Whilst every attempt is made to keep the price of the issues and binders constant, the publishers reserve the right to increase the stated prices at any time when circumstances dictate. Binders depicted in this publication are those produced for the UK and Australian markets only. Binders and Issues may be subject to import duty and/or local taxes, which are not included in the above prices unless stated.

ADDRESS FOR SUBSCRIPTIONS
Orbis Publishing Limited
Hurst Farm
Baydon Road
Lambourne Woodlands
Newbury
Berks
RG16 7TW
Telephone: 0488-72666

All cheques/Postal Orders should be made payable to Orbis Publishing Limited. Postage and packaging is included in subscription rates, and prices are given in Sterling.

Post-War Transport Aircraft

The Royal Air Force retired its last Hastings transport aircraft in January 1968, replacing them with Lockheed Hercules. A handful of Hastings T.Mk 5s, used for the training of V-force crews, soldiered on until the 1970s.

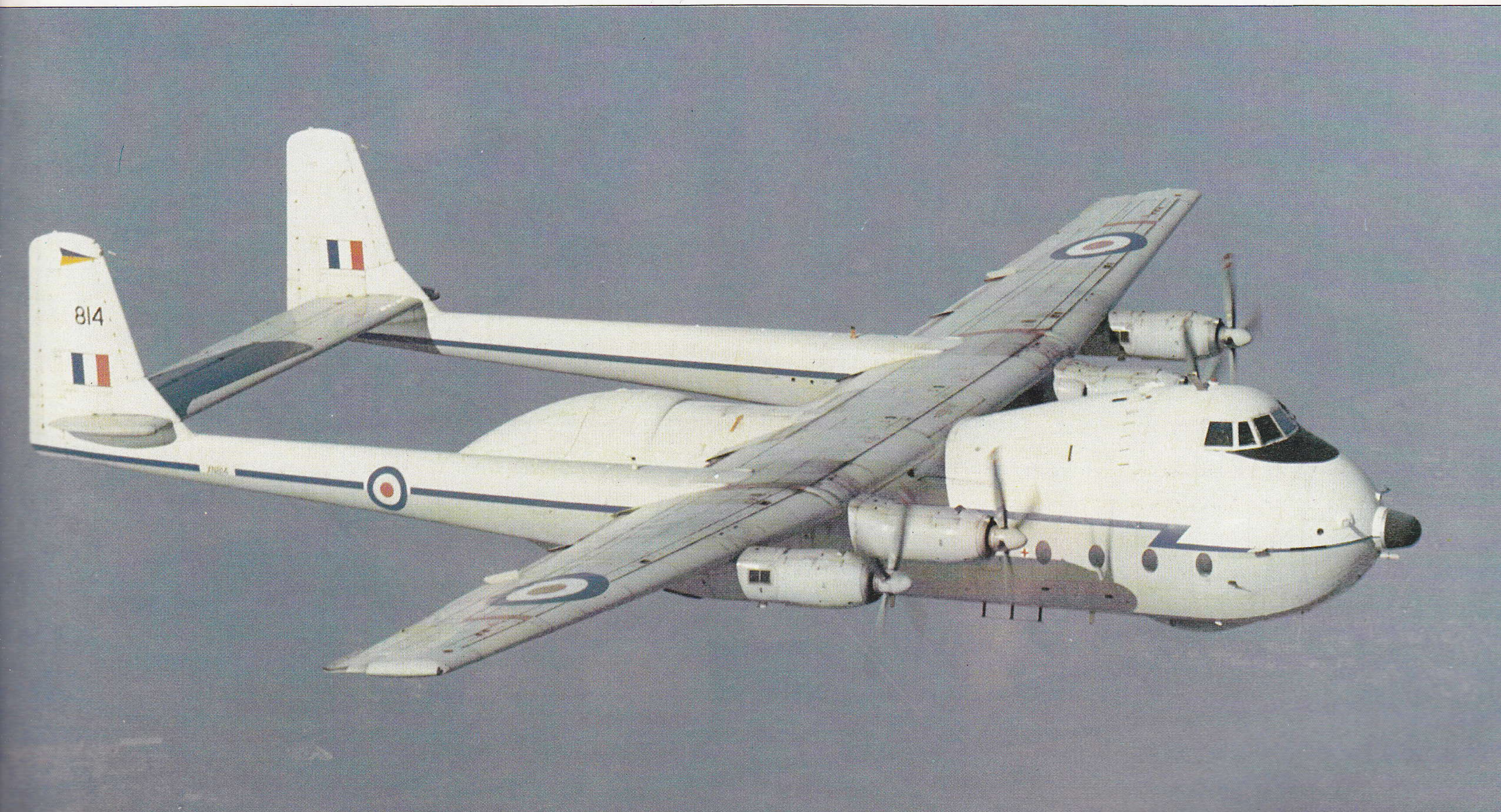
From Afghanistan to Grenada, from the equator to the poles, the modern military transport aircraft is an indispensable part of the armed forces of today. This widespread use found its origin not, as might be expected, during World War II, but in the ensuing years as wartime lessons were absorbed.

Although their origins may be traced to operations such as the RAF-run evacuation from Kabul in 1928, the air drops of World War II's closing stages, and mercy missions like the 10-day Operation 'Manna' of 1945 when 33 British squadrons flew 3,180 sorties to feed the starving people of the Netherlands, air transport as it later evolved was an entirely post-war development; it was only the introduction of new types such as the Blackburn Beverley, Antonov An-12 and Douglas C-124 Globemaster that made it possible.

The modern theory of few aircraft with huge capacities, the antithesis of the massive airborne operations before the Allied victory in Europe, was to be seen in its pioneer light in a pamphlet produced for troops about to be moved by air for operations against Japan in 1945. This opened with the words 'You are making history. This is the first time that regular and large-scale movement of troops has been undertaken', although the size of the aircraft was comparatively puny and their range limited; so it was left to types like the British Handley Page Hastings and Vickers Valettas to fly the first of the new-type sorties in anger at the time of the Suez campaign in 1956.

Apart from a few excursions into the realm of twin-boom configuration, or others with massive central pods, the post-war period was also one in which there evolved the basic transport aircraft design that has since persisted, with low-slung fuselages on multi-wheel landing gears set in their sides, coupled with sharply raked rear sections incorporating ramps so that loads made possible by the new generation of powerplants could be swiftly emplaned. Small wonder therefore that the period became the one associated with the so-called 'fire brigade' operations, when the United Nations in particular quickly moved substantial numbers of troops to the world's trouble spots.

An Armstrong Whitworth Argosy is seen towards the end of its service life. Like several other designs of the 1940s and 1950s the problem of loading and unloading large cargoes was solved by the adoption of a twin boom configuration, allowing unrestricted access to the aircraft.



Operation 'Plainfare': The Berlin Airlift

In the years immediately following the German surrender in 1945, the Allied presence in Berlin, in the heart of Soviet-occupied Germany, was in constant danger of being overwhelmed. When the Russians embargoed all goods passing through 'their' territory, the only access to the beleaguered city was by air.

Above: In the early morning at Gatow, in the British sector, a block of USAF C-54s unload coal flown in from Fassberg. Gatow was the Berlin terminal for the relief flights originating in the British-occupied sector of Germany. In the harsh winter, coal was an essential element of the relief supplies, and many thousands of tons were brought in.

Below: Tempelhof saw a temporary cessation of operations during the night of 28 February, but the vicious weather cleared by morning, leaving a blanket of snow on the field. Flying could proceed, and the USAF C-54s, each capable of carrying 10 tons, continued to bring in badly-needed supplies.

Even the Handley Page Halifax, in the transport variant of the bomber which had so recently been bombing the German capital, was pressed into service during the Berlin Airlift of 1948. The events that led up to the employment of these 41 civil aircraft, together with other civil machines and hundreds of Douglas Dakotas and Avro Yorks, together with 14 Handley Page Hastings transports, had begun with a deterioration in the relations between the Soviet authorities and the other three powers, all recent allies, which controlled the zones into which the former German capital was divided.

To reach this city at all a trip of some 160 km (100 miles) had to be made through Soviet-held territory, so that it was easy to place restrictions on the road and rail supplies reaching a Berlin which Stalin now felt to be an anomaly after the creation of a virtually independent West Germany. Consequently when the Soviet authorities announced that their guards would reserve the right to inspect all vehicles coming from the three Western zones as from 31 March 1948, the West suspended all but trains and motor vehicles taking food and essential goods. The Soviet countermeasure came with the banning of all travel to Berlin from midnight on 18 June, and six days later food trains were stopped. The reaction to this was to keep the city supplied by air, and to do so a vast armada of military transports and civil machines was assembled, together with a massive number of crews, some of them capable of taking in the Short Sunderland flying-boats detailed to use the city's Havelsee for landing.

Thus began Operation 'Plainfare' which brought aircraft to Tempelhof and Gatow at 90-second intervals, usually with a turn round

It should be remembered that while the bulk of the airlift capacity was supplied by the USAF and RAF, civil operators flying aircraft such as these Lancastrian tankers made an extremely important contribution to the airlift.

time of no more than 30 minutes both by day and night, their cargoes for the trips home being Berlin's manufactured goods in place of the food, coal and wet supplies that had been brought in. Tanker aircraft excepted, there was no restriction of any particular machine to a specific type of cargo; one airman remembers the sight of spilled grain from an earlier run beginning to sprout inside a Douglas DC-3, germinated by the moisture splashed from another load.

To achieve the remarkable turnround figures, tracks to Berlin were not made through the same corridors as those home. Even when they were to and from the USAF base at Tegel (at the end of the most northerly of the three corridors over the Soviet zone), aircraft leaving Berlin were restricted to an altitude of 305 m (1,000 ft), the eight flight paths to a maximum of 1676 m (5,500 ft) above them being reserved for tracks of machines to Berlin, with one for emergency use.

Major among the aircraft making the US contribution was the Douglas C-54 Skymaster, each of these aircraft capable of carrying 10 tons. They also had the advantage of longer periods between servicing than the DC-3s, so that with fewer crews involved larger quantities of material could be transported, more being added after mid-October with the retirement of the C-47s. This time also saw an official amalgamation of the British and US effort into the Combined Air Lift Task Force, many of the British Yorks henceforth being reserved for the movement of awkward cargo which took longer to unload.

The movement of supplies was not the limit of the problems of Operation 'Plainfare', for the airfields involved had huge demands made upon them with the result that their enlargement and maintenance became the responsibility of the Royal Engineers and the Pioneer Corps; the Royal Army Service Corps supervised ground transport arrangements and the 7th Armoured Division was in charge of security, in collaboration with the infantry.

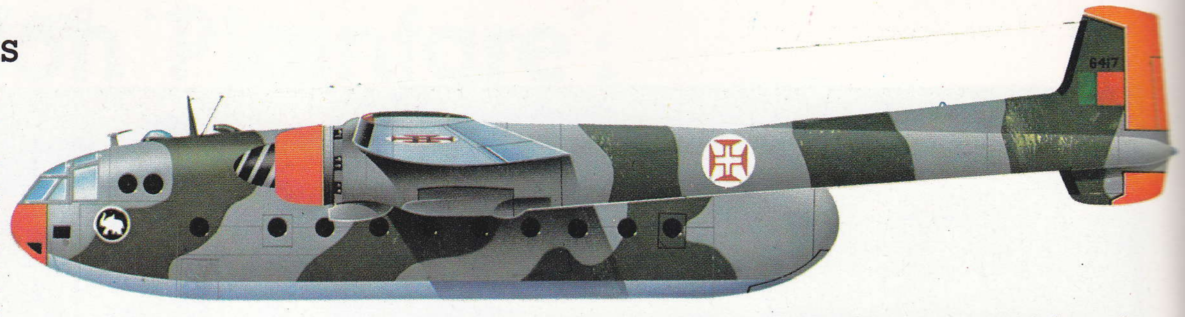
Largest of all the transports involved in the airlift were the Douglas C-124 Globemasters, and these so influenced military transport thinking that it was at this time that it was realized how advantageous it was to use a lesser number of very large aircraft rather than a larger number of smaller ones. The size of the contribution made by these giants is obvious from the fact that their capacity was more than twice that of a C-54, although on the debit side was the fact that the great weight of the larger Douglas tended to break up the aerodrome taxi tracks and runways at Tempelhof.

With operations taking place round the clock seven days per week, it was clear that the Allies were determined to keep Berlin supplied at all costs, and although there was a small lessening in the intensity of the programme as a result of the weather in November 1948, the pace showed no sign of slacking by 12 May 1949, the date on which the Soviet authorities announced that the lifting of the blockade on surface traffic would take effect as from one minute past midnight. Even so, the airlift was continued for a further four months in case restrictions were reintroduced. In total the operation had lasted for a period of 15 months during which 49,733 sorties had been flown by the RAF alone, the later ones being largely performed with Yorks, flying alongside the Skymasters with which the US forces specialized. Independent airlines were also involved, these being entirely responsible for the movement of fuel and oil, one of the chief among these being the Airflight organization which flew Avro Tudors.

Not generally known is the fact that Operation 'Plainfare' was originally described as 'Knicker', and later as 'Carter Paterson' (the title of the British national carriers at the time) before the final name was adopted. Nor is it generally known that there were 17 serious accidents claiming the lives of 51 airmen. This was the cost of the flights that brought to every Berliner an average of 1 ton of food and supplies, the grand total being 2363138 tonnes (2,325,809 tons). This figure might have been exceeded further had it not been that the arrangements (made by US Major-General William H. Tunner on first taking command, some time after the original airlift was launched) placed the RAF flights at a disadvantage; ideally the above figures, impressive as they are, could have been exceeded. It was a tremendous indication of the potential of air transportation on the grand scale.

FRANCE

Nord Noratlas



Above: One of 10 Noratlas supplied to Portugal, now replaced by the C-130 Hercules. Extensively used in the colonial struggles in Angola and Mozambique, it is believed that some ex-Portuguese aircraft are still in operation in the latter country, supplementing Soviet-supplied aircraft.

Resembling such designs as the Fairchild C-82 and C-119 in having a twin-boom layout, the **Nord Noratlas** derived from the earlier **Nord 2500**, the new machine flying for the first time in 1949. With a crew of five (pilot, co-pilot and navigator at the front and a radio operator and flight engineer aft) the Noratlas is capable of taking a considerable military load in the remainder of the central pod by virtue of its reinforced floor which, with a maximum height of 2.75 m (9 ft) and a deck area of 9.9 m (32 ft 6 in) by 2.4 m (7 ft 10 in), can accommodate 36 fully-armed paratroops, or alternatively 45 ordinary soldiers. Military vehicles can also be carried, and offloaded quickly through the twin rear cargo doors that are removed for air drops.

Although the major operator of the Noratlas when new was the Armée de l'Air, for which more than 200 were produced, 186 saw service with the Luftwaffe's three tactical transport wings, LTG 61, 62 and 63. Of this number 136 were manufactured under licence by Flugzeugbau Nord, the remainder being supplied from France. When from 1968 the type began to be phased out of use by the six 18-aircraft German squadrons, about 40 were sold to Greece and about half that number to Israel. Ten were used by Portugal.

Apart from the versions of the Noratlas flying with the French transport units, others were used for training, including some operated by *Groupement Ecole 316* for navigational instruction, while the type has also been used as a back-up machine for the *Patrouille de France* aerobatic team.

Although the prototype Noratlas was powered by twin 1193-kW (1,600-hp) Gnome-Rhône 14R radial motors, production versions have flown with a choice of French-built Bristol Hercules engines, in one form driving reverse-pitch four-blade propellers.

Specification
Noratlas

Type: military transport capable of taking vehicles, freight, 45 troops or 36 paratroops

Powerplant: two 1521-kW (2,040-hp) SNECMA-built Bristol Hercules air-cooled radial piston engines

Performance: maximum speed 440 km/h (273 mph) at sea level; rate of climb 375 m (1,230 ft) per minute; service ceiling 7500 m (24,606 ft); range 3000 km (1,864 miles)

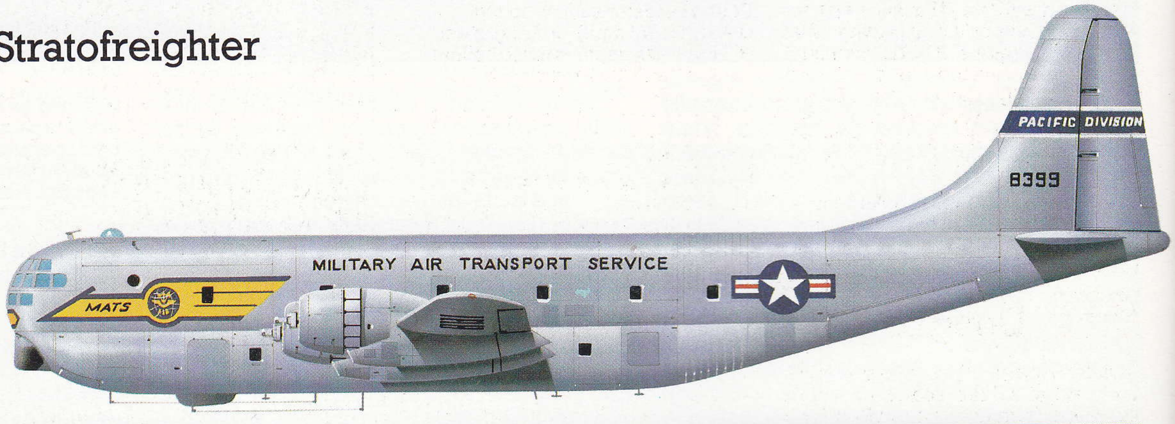
Weights: empty 13075 kg (28,825 lb); maximum take-off 23000 kg (50,706 lb)

Dimensions: span 32.50 m (106 ft 7.5 in); length 21.96 m (72 ft 0.6 in); height 6.00 m (19 ft 8.2 in); wing area 101.2 m^2 (1,089.3 sq ft)

Below: France accepted delivery of over 200 Noratlas, more than half remaining active into the 1980s. With a cargo capacity of some 8 tonnes, the Noratlas can carry up to 45 troops or 36 fully equipped paratroops. It has been joined in the Armée de l'Air by the Transall C-160, a more modern design.

USA

Boeing C-97 Stratofreighter



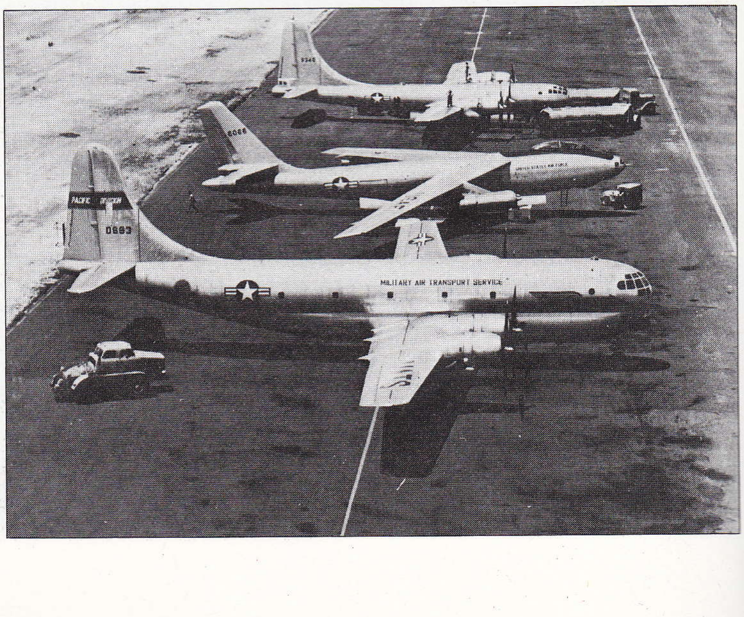
Above: Derived from Boeing's wartime B-29 Superfortress, the C-97 was the result of a requirement for a long-range, high-capacity transport aircraft. This machine was the third of the initial batch of 50 production aircraft. It had an APS-42 weather avoidance radar in a chin radome.

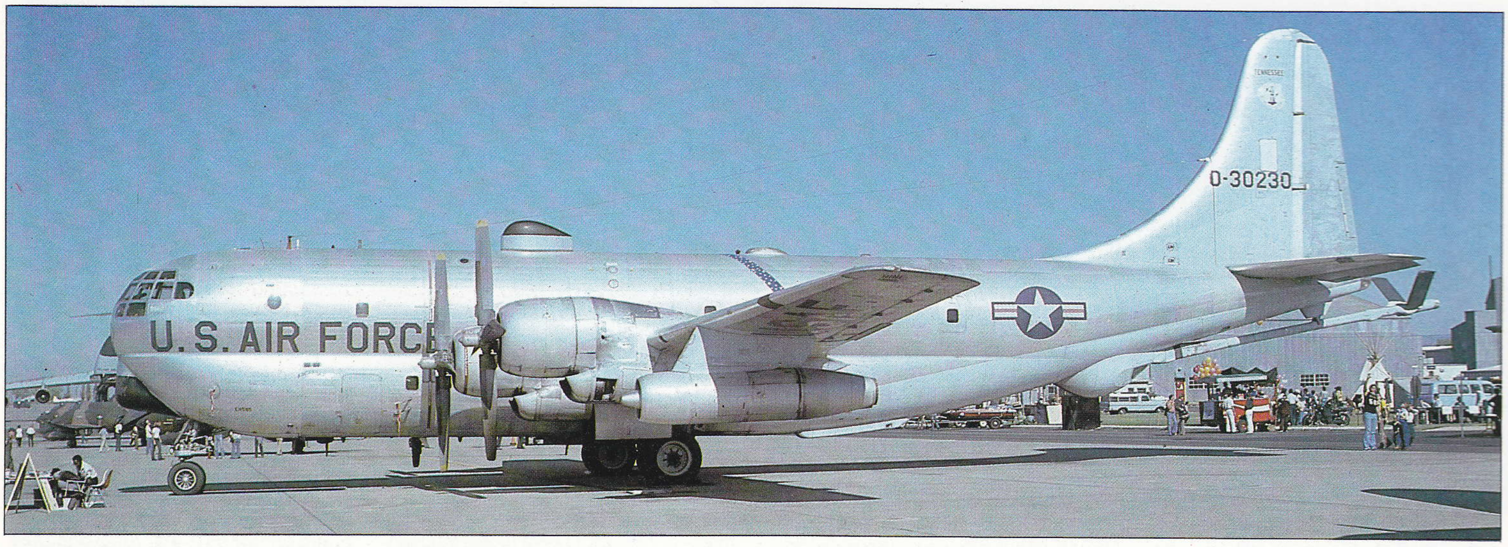
One of the most capable transport aircraft to see service with the US Air Force, the **Boeing Model 367** flew for the first time on 15 November 1944 and was essentially based on that company's highly successful B-29 Superfortress, whose wing and engine layout it directly inherited. This was married to a revised fuselage which incorporated the now-famous 'double-bubble' cross-section and which resulted in the type possessing a portly appearance which rather belied its versatility.

Evaluation of three **XC-97** prototypes was accomplished quite swiftly and satisfactorily, culminating in July 1945 in an order for 10 **YC-97** aircraft for further evaluation, but it was not until March 1947 that the **C-97A Stratofreighter** was committed to production. The initial contract was modest, covering just 27 C-97A troop/cargo transports, although 23 more were ordered in the following year. The next new-build version (again a pure troop/cargo aircraft) was the **C-97C**, which featured a strengthened cabin floor and detail changes, but only 14 were built and these, like the earlier C-97As, were assigned to the Military Air Transport Service.

Experiments conducted with three aircraft which had been fitted with the Boeing-developed inflight-refuelling boom revealed that the C-97 possessed considerable promise as a tanker aircraft; it was in this role that the type was most widely used, equipping over 40 Strategic Air Command squadrons at its peak in the mid- to late-1950s. The first dedicated tanker model was the **KC-97E**, of which 60 were built, and these were followed by 159 examples of the **KC-97F** which differed mainly in that it featured slightly more powerful engines. Both of these sub-types were convertible tanker/transports unlike

Right: Boeing were supplying large numbers of aircraft to the newly independent USAF in the late 1940s. The C-97 gave long range support to the B-50 (a developed B-29) as well as to the revolutionary new bomber, the B-47. Few would have guessed that C-97s would still be supporting the USAF 30 years later.





Above: One of the last surviving KC-97Ls, displaying one of the J47 jet engines fitted to some ANG tankers in the 1970s to enable the 25-year-old airframes to operate with younger, high-performance jets. The last KC-97 was retired in 1978, the type having provided over 30 years of service.

the **KC-97G**, which possessed the ability to fulfil both missions without recourse to reconfiguring the aircraft. This was the definitive Stratofreighter, no less than 592 being manufactured before production came to an end in 1956.

Subsequently, the advent of the Boeing KC-135 Stratotanker resulted in the then-surplus KC-97s being modified for other duties. Many former tankers had the refuelling gear removed and were extensively employed as pure cargo aircraft by the Air National Guard, while this organization also acquired a number of tankers, some of which were later retrofitted with two J47 auxiliary jet engines in place of the underwing fuel tanks. Known as the **KC-97L**, this model possessed enhanced performance and eventually became the last version of the Stratofreighter to see service with the USAF in any capacity, the final examples being retired in the summer of 1978.

In addition to use as a tanker and/or cargo aircraft, variants of the Stratofreighter undertook such disparate tasks as electronic countermeasures (**EC-97G**), search and rescue (**HC-97G**), SAC mission support (**C-97K**), VIP-type transportation (**VC-97**) and research into turboprop powerplants (**YC-97J**), while small numbers also saw service overseas, most notably with Israel and Spain in the inflight-refuelling role.

Specification

KC-97G

Type: transport and inflight-refuelling aircraft

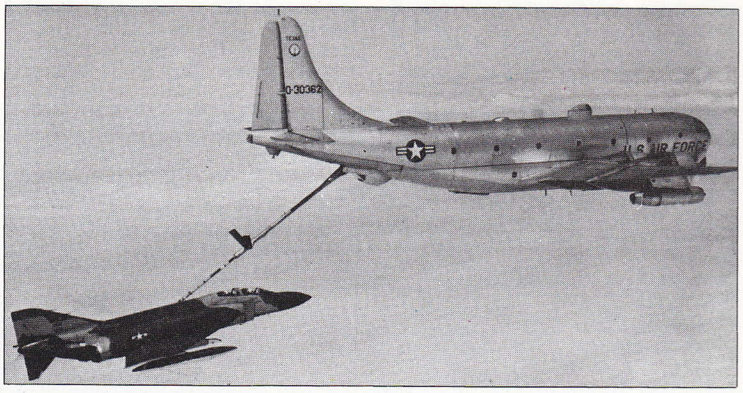
Powerplant: four 2610-kW (3,500-hp) Pratt & Whitney R-4360-59 Wasp Major radial piston engines

Performance: maximum speed 604 km/h (375 mph); cruising speed 483 km/h (300 mph); service ceiling 10668 m (35,000 ft); range 6920 km (4,300 miles)

Weights: empty 37421 kg (82,500 lb); maximum take-off 79379 kg (175,000 lb)

Dimensions: span 43.05 m (141 ft 3 in); length 33.63 m (110 ft 4 in); height 11.66 m (38 ft 3 in); wing area 159.79 m^2 (1,720 sq ft)

Below: An ANG KC-97L refuels an F-4D Phantom while on detachment to Rhein-Main AB in Germany. When it first flew, the main US fighters were the piston engined P-47 and P-51, and inflight-refuelling was virtually unknown. In the span of one type's career, aircraft have seen an enormous increase in performance and capability.



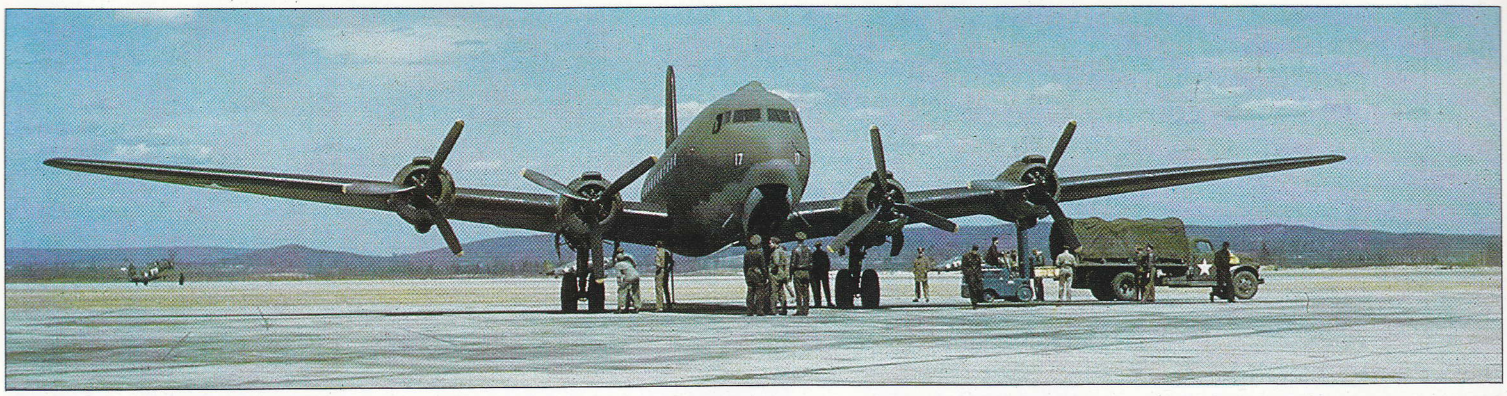
USA

Douglas C-54 Skymaster and C-118 Liftmaster

Initially conceived as a four-engine commercial airliner and first flown in prototype form as the DC-4E in June 1938, the Douglas Aircraft Company's first venture into large transport aircraft proved unsuccessful, prompting a return to the drawing board which resulted in the smaller but more capable **Douglas DC-4A** which did find favour, most notably with US airlines anxious to improve transcontinental services.

Fitted with seats for 42 passengers, the two dozen DC-4As on the production line at the time of the US entry into World War II were taken over by the US Army Air Force and given the service designation **C-54 Skymaster**.

Douglas C-54 Skymasters of the 403rd Troop Carrier Command are seen during the May 1952 operation to transport paratroopers of the 187th Regimental Combat Team to Korea. More than 100 aircraft carried over 1000 tonnes of men and equipment across the Sea of Japan to their new locations.



A C-54 is shown in the olive drab colour scheme carried on the North Atlantic run during World War II. Scaled down from the original over-ambitious pre-war design, the C-54/DC-4 family came to be one of the mainstays of post-war long-distance travel, both civil and military.

Thereafter, the basic aircraft was subjected to considerable redesign which resulted in the appearance of a general-purpose cargo version known as the **C-54A**, 252 of which were built. Further refinement led to the appearance of improved variants, these being the **C-54B** (220 built), **C-54D** (380), **C-54E** (125) and **C-54G** (162), and by the time production terminated no less than 1,245 had been completed, this total including 79 DC-4s built in the post-war era for commercial operators.

In US service the C-54 proved to be a most versatile machine, undertaking the movement of troops, cargo and casualties, while specialized modifications fulfilled such tasks as navaid calibration, search and rescue, weather reconnaissance, missile tracking, communications and general-purpose transport duties. In addition to seeing extensive service with the USAAF, almost 200 Skymasters were diverted as **R5D** aircraft to the US Navy and US Marine Corps, examples remaining active with these three services until the mid-1970s, albeit in ever diminishing numbers.

The Skymaster also proved popular with overseas air arms, as did the **C-118 Liftmaster** which succeeded it in production in the late 1940s, this being basically an enlarged and pressurized C-54 with more powerful engines. Flown in prototype form as the **XC-112A** in February 1946, a civil counterpart (the **DC-6**) was built in substantial numbers, of which quite a few found their way into military service. Production for the US armed forces totalled 166, comprising 101 **C-118A** transport and one **VC-118** presidential aircraft for the USAF's Military Air Transport Service plus 65 **R6D** (later redesignated **C-118B**) transports for the US Navy's small number of airlift squadrons. Although most of the surviving aircraft were retired in the 1970s, a handful of C-118As and C-118Bs remains active with Navy Reserve transport squadrons in mid-1985, some of these being former USAF examples.

Specification
C-118A

Type: four-engine transport aircraft

Powerplant: four 1864-kW (2,500-hp) Pratt & Whitney R-2800-52W Double Wasp radial piston engines

Performance: maximum speed 573 km/h (356 mph) at 5974 m (19,600 ft); cruising speed 504 km/h (313 mph) at 6218 m (20,400 ft); normal range 6148 km (3,820 miles)

Weights: empty 23358 kg (51,495 lb); maximum take-off 44089 kg (97,200 lb)

Dimensions: span 35.81 m (117 ft 6 in); length 30.66 m (100 ft 7 in); height 8.66 m (28 ft 5 in); wing area 135.36 m^2 (1,457 sq ft)

UNITED STATES AIR FORCE
403
ESSO
ESSO AVIATION SERVICE
NO SMOKING WITHIN 50 FT

The Berlin Airlift saw the first major test of air logistics on the grand scale, and it was the 10-tonne capacity of the C-54 which proved vital to the massive USAF contribution to Operation 'Vittles' (the US term).

USA

Douglas C-124 Globemaster II

With well over 400 aircraft completed during the late 1940s and early 1950s, the **Douglas C-124 Globemaster II** served as the USAF's principal cargo aircraft until largely replaced by more modern jet and turbine-powered equipment during the latter half of the 1960s, thereafter enjoying a new lease of life with second-line echelons of this air arm. Indeed, it was not until September 1974 that the last examples were finally stood down by the Air National Guard, after nearly a quarter of a century of service.

Colloquially known as 'Old Shaky', the C-124 was essentially a redesigned version of the earlier **C-74 Globemaster I**, the prototype **YC-124** being simply a conversion of the fifth production C-74, incorporating a much revised fuselage with clamshell-type nose doors to ease the loading of cargo. Engine installation initially remained unchanged for the YC-124, although this

15188
U.S. AIR FORCE
TROOP CARRIER

Developed from the C-74 Globemaster I, the C-124 featured a deeper body and enormous clamshell loading doors in the nose. With two decks installed, the Globemaster could transport over 200 fully equipped troops. The C-124 remained in service for 20 years until replaced by the massive C-5 Galaxy.

Douglas C-124 Globemaster II (continued)

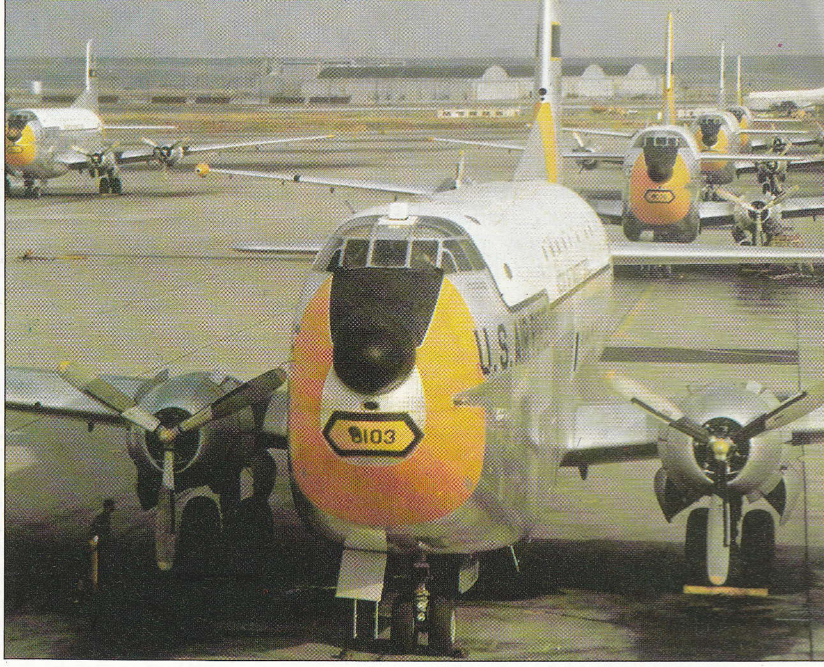
aircraft was later fitted with 2834-kW (3,800-hp) R-4360-35A engines and redesignated as the **YC-124A**. Subsequent production of the **C-124A** variant witnessed fitment of yet another version of Pratt & Whitney's well-proven and reliable radial engine, this being the R-4360-20WA rated at 2610 kW (3,500 hp).

A total of 204 C-124As had been completed when production switched to the **C-124C** variant which introduced a number of new features, including APS-42 weather search radar in a bulbous nose radome as well as combustion heaters in wingtip fairings, increased fuel capacity and more powerful R-4360-63A engines. Production of the C-124C derivative totalled 243, and most of the older C-124As were retrospectively fitted with radar and wingtip heaters, making them virtually indistinguishable from the final version of the Globemaster II.

In addition to the two major production sub-types, one aircraft was completed as the **YC-124B**, this featuring a quartet of Pratt & Whitney YT34-P-6 turboprop engines, each rated at 4101 kW (5,500 eshp). As well as the revised engine installation, this machine also had enlarged vertical tail surfaces and a modified tailplane, and it spent most of its flying career with the Air Research and Development Command in turboprop evaluation.

Specification
C-124C

Type: strategic transport aircraft
Powerplant: four 2834-kW (3,800-hp) Pratt & Whitney R-4360-63A air-cooled radial engines
Performance: maximum speed 489 km/h (304 mph) at 6340 m (20,800 ft); cruising speed 438 km/h (272 mph); service ceiling 5608 m (18,400 ft); range with 25401-kg (56,000-lb) payload 1983 km (1,232 miles)
Weights: empty 45888 kg (101,165 lb); normal loaded 83915 kg (185,000 lb); maximum take-off 88224 kg (194,500 lb)
Dimensions: span 53.07 m (174 ft 1.5 in); length 39.75 m (130 ft 5 in); height 14.72 m (48 ft 3.5 in); wing area 232.81 m^2 (2,506 sq ft)



The Douglas C-124 Globemaster II gave the USAF badly-needed heavy airlift capacity in the 1950s. Seen here are C-124As brought up to C-124C standard with an AN/APS-42 weather radar in the nose and with combustion heaters at the wingtips for cabin heating as well as wing and tail de-icing.

USA

Douglas C-133 Cargomaster

Designed to fulfil the strategic transport role with the USAF's Military Air Transport Service (MATS), the **Douglas C-133 Cargomaster** was operated in only modest quantities, just 50 examples being built before production terminated in the spring of 1961.

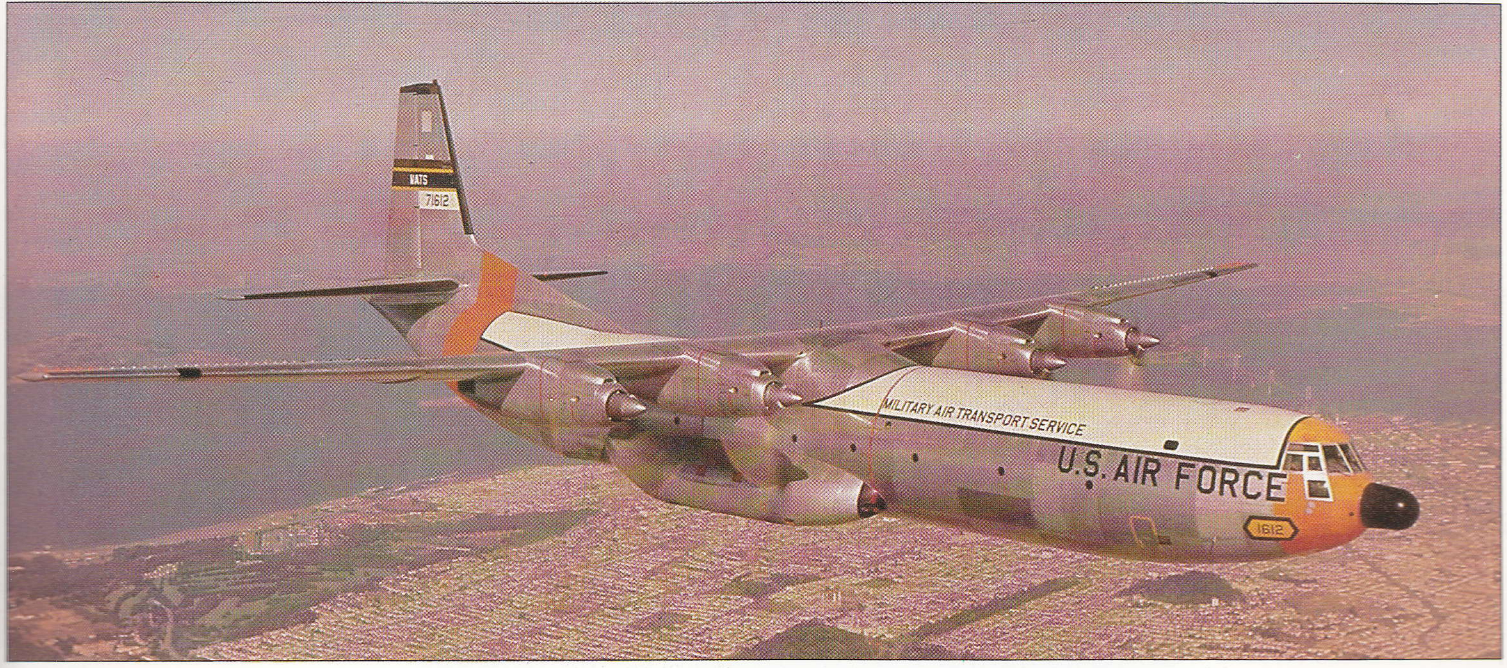
Development of the Cargomaster began during the early 1950s, and it was on 23 April 1956 that the first **C-133A** made its maiden flight, there being no prototype in the normally accepted sense of the word. Two basic sub-types were produced, the first of which was the Douglas Model 1333. In USAF service this adopted the designation C-133A, initial production examples being powered by the T34-P-3 engine which was rated at 4474 kW (6,000 eshp), although this was supplanted by the 4847-kW (6,500-eshp) T34-P-7 or T34-P-7WA on later C-133A models. C-133A production ended with the 35th aircraft, 15 examples of the rather more powerful **C-133B** (Douglas Model 1430) following them down the assembly line and all featuring the clamshell tail loading doors which were introduced on the penultimate C-133A and which facilitated the loading of Atlas and Titan ICBMs, and Thor and Jupiter IRBMs. Other cargo could, of course, be carried, the C-133B having a payload capability in excess of 45360 kg (100,000 lb) while as a troop carrier it could accommodate some 200 soldiers and their personal kit.

In operational service the Cargomaster was employed by MATS (and its successor Military Airlift Command) for many years, equipping elements on both east and west coasts of the USA and generally undertaking long-haul missions throughout the world. However, the type did suffer from a number of problems which resulted in it being grounded on several occasions following serious accidents, most of which were attributed to fatigue. It was probably with a sense of relief that MAC eventually withdrew the 35 or so surviving examples in 1971-2, the long-haul heavy-lift mission then being entrusted to the truly massive Lockheed C-5A Galaxy. Most of the remaining Cargomasters were eventually scrapped, but a small number found a new lease of life with civil operators and one is believed still to be active in Alaska.

Specification
C-133B

Type: strategic heavy-lift transport
Powerplant: four 5593-kW (7,500-eshp) Pratt & Whitney T34-P-9W turboprops
Performance: maximum speed 578 km/h (359 mph) at 2652 m (8,700 ft); range with 35235-kg (77,680-lb) payload 2780 km (1,727 miles); range with 23516-kg (51,845-lb) payload 6,486 km (4,030 miles)
Weights: empty 54550 kg (120,263 lb); normal loaded 129727 kg (286,000 lb); maximum take-off 136078 kg (300,000 lb)
Dimensions: span 54.76 m (179 ft 7.75 in); length 48.02 m (157 ft 6.5 in); height 14.71 m (48 ft 3 in); wing area 248.32 m^2 (2,673 sq ft)

The Douglas C-133 Cargomaster was an advanced transport with multi-wheel landing gear in side blisters and a ramp for the straight-in loading of vehicles. Late examples of the 50 built featured rear clamshell doors, but although a capable aircraft the design suffered from fatigue problems.



C-119 in Action

Designed at the end of World War II the Fairchild C-82/119 family of tactical transports was at Berlin for the airlift, received a baptism of fire in Korea, moved goods all over the world, and eventually gave birth to an awesome combat aircraft in the AC-119G 'Shadow' gunship in the night skies of Vietnam.

Although conceived as a pure tactical transport aircraft, intended for the movement of troops and cargo, Fairchild's distinctive family of twin-tailed freighters proved sufficiently versatile and (perhaps more importantly) durable to undertake combat action in two very different roles. Primarily employed as an airlift aircraft, the C-82 and the later and rather more capable C-119 performed with distinction on numerous occasions in times of peace and war; while the heavily armed and armoured gunship derivatives of the latter type proved of great value during the Vietnam War, permitting the Flying Boxcar to enjoy a new lease of life in the twilight years of its front-line career.

C-82 in the Cold War

Although arriving on the scene too late to see action in World War II, the C-82 did play a small but nevertheless important part in the first of several major Cold War confrontations between the USA and the USSR, namely Operation 'Plainfare', the codename given to the Berlin Airlift of 1948-9. Despite the fact that only a handful of C-82s was involved, these proved to be of particular value in that the aft-loading cargo doors permitted smooth and rapid movement of vehicles into the beleaguered city, these subsequently being used to transfer food and other vital supplies within the environs of Berlin.

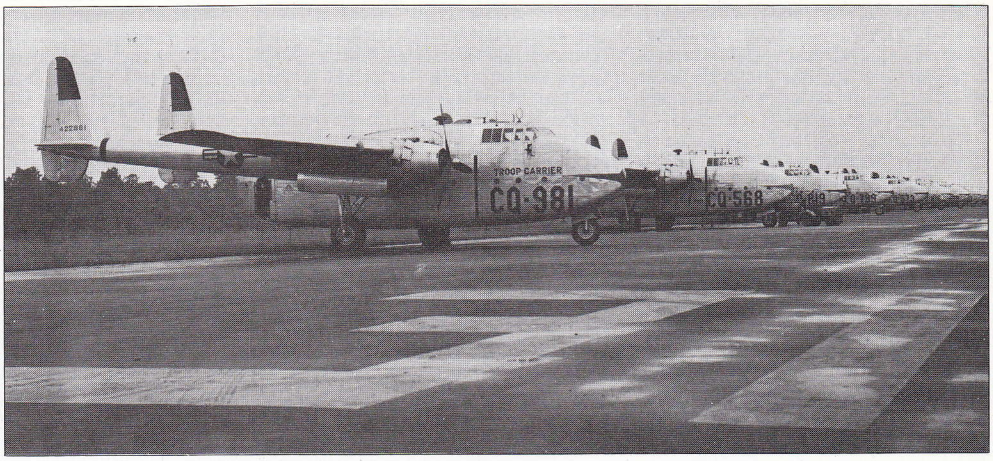
By the time of the next clash of will between the two superpowers, the C-82 had been largely relegated to second-line elements of the US Air Force and, as a result, it played little or no part in the Korean War. However, by then an improved version known as the C-119 Flying Boxcar had arrived on the scene and this was extensively used in this long conflict, elements of Tactical Air Command's airlift force such as the 314th Troop Carrier Group being quickly committed to South East Asia.

For the most part, the airlift units operated from bases in Japan, being employed mainly on the repetitive but nevertheless necessary job of hauling cargo and personnel to United Nations facilities in Korea. In addition, they also frequently undertook the air-dropping of supplies to isolated outposts by parachute, a task which called for a high degree of skill since it entailed accurate flying at low altitude if correct delivery was to be guaranteed. It also called for a certain amount of courage, for it was by no means uncommon to run into accurate and potentially deadly small arms fire when engaged in such missions.

Potentially more hazardous tasks also came their way on occasion, one particularly notable instance of the latter occurring during the early months of the war, on 20 October 1950. On that date a force of 71 C-119s teamed up with 40 Douglas C-47s to deliver 2,860 troops and just over 300 tons of equipment of the 187th Airborne Regimental Combat Team to a point astride the major transportation network near Sukchon and Sunchon, some 48 km (30 miles) north of Pyongyang. Conducted in conjunction with tactical fighter and light bomber aircraft which worked over the drop zone just before the transports were due to arrive, this operation was spectacularly successful; most of the North Korean defensive forces abandoned their dug-outs and fled to safety, leaving the US troops to face only modest resistance and thus permit them to secure their objectives in remarkably short order. Such operations were the exception rather than the rule, however, and most of the time the job of the transport crews was one of grinding monotony.

The scope of combat-type C-119 operations expanded still further shortly before the end of the Korean War and involved activity in an area not too far removed from Korea, namely

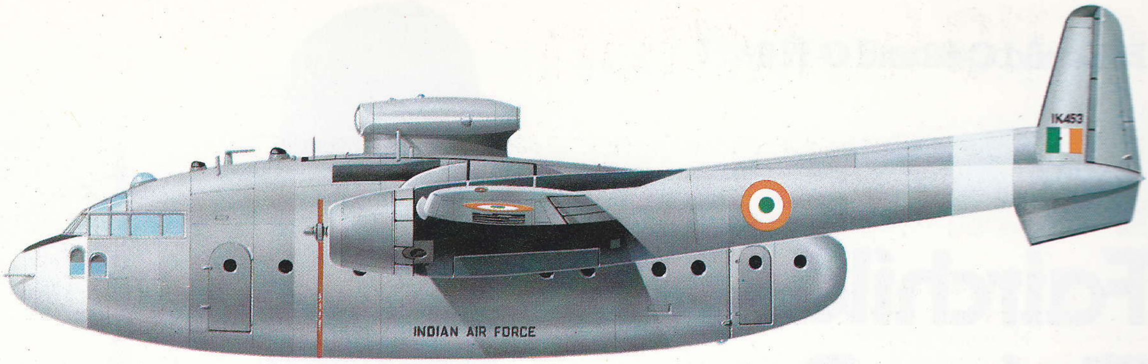
C-82s of the 316th Troop Carrier Wing are seen at Eglin AFB in Florida. In September 1948, when this picture was taken, the production run of 220 C-82s was coming to an end, making way for the greatly-improved version of the design, the C-119 Flying Boxcar.



Below: While fighters grabbed many of the headlines in Korea, units such as the 314th Troop Carrier Wing proved vital. Despite often appalling weather, their C-119s flew resupply missions into the most difficult of mountain terrain and, more often than not, got through.

102
UNITED STATES AIR FORCE

Other users of the C-119 include the Indian Air Force, who at one time equipped three squadrons with the Boxcar. The 40 aircraft were notable for the installation of a single HAL-built jet engine, installed in a pod above the central section, for assistance in operating under 'hot and high' conditions.



French Indo-China, and most particularly Vietnam, where French colonial aspirations were taking a bit of a battering at the hands of the Viet Minh. The initial employment of the C-119 in this theatre occurred in May 1953, six aircraft being furnished by the Far East Air Force command, although these were actually flown by contract pilots from Civil Air Transport in Taiwan. This organization was incidentally a well known front for clandestine activities conducted by the Central Intelligence Agency. On this occasion, the Boxcars were employed to airlift French tanks and other heavy equipment into Laos, a task which kept them occupied until late July when they were withdrawn from this theatre, only to return at the beginning of December when the French began to build up their forces at the base at Dien Bien Phu.

Indo-China operations

Rather more aircraft took part this time, the number present varying from about 12 to 22 and the operation went by the codename 'Swivel Chair'. Much the same arrangement as before was adopted as regards crewing this aircraft, although the contract pilots were joined by personnel of the French air force and the C-119s accordingly adopted French national markings while most, if not all, seem to have retained USAF unit insignia.

The opening months of 1954 provided some indications of what was to follow but, for the most part, the C-119s went about their business unhindered. It was not until 10 March that the siege of Dien Bien Phu began with shelling of the two airstrips. Four days later the main strip was closed and it was at this time that C-119 casualties began to mount, one machine being destroyed on the ground along with a number of other aircraft. Shortly afterwards accurate anti-aircraft fire and continued shelling resulted in the outpost being virtually cut off, leaving aerial resupply as the only means of preventing the garrison from being overrun. Thus began the siege which was to result in victory for the Viet Minh on 7 May.

In the interval, the C-119s performed sterling work in keeping the garrison supplied, operating alongside French C-47s, although as the situation worsened it became necessary to provide fighter escort, Grumman F6F Hellcats and Grumman F8F Bearcats and Douglas B-26 Invaders being employed in the flak suppression role.

Even then, the Flying Boxcars suffered their fair share of casualties. For instance, no less than 19 aircraft received damage from the intense and accurate 37-mm anti-aircraft artillery which surrounded Dien Bien Phu during April, On 6 May, barely 24 hours before the garrison fell, the legendary Civil Air Transport contract pilot James B. McGovern (perhaps better known as 'Earthquake McGoon') died when the C-119 he was flying took a direct hit from 37-mm flak.

End of conflict

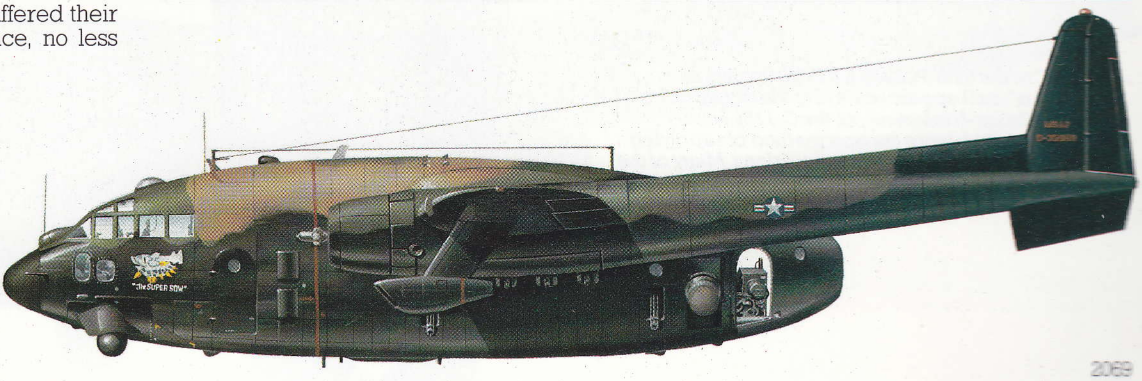
Victory at Dien Bien Phu did not quite mark the end of the conflict, although it was clearly a significant turning point after which French resolution quickly crumbled. Nevertheless, they fought on for a little while longer and the 'Swivel Chair' C-119s duly remained active in Indo-China until mid-July, when they began to return to the USAF, a process which ended in early September with the arrival of the last aircraft at Clark Air Base in the Philippines.

Fifteen years later, USAF Flying Boxcars were again in action in South Vietnam, albeit in a rather different capacity since these were gunships. Two basic models were employed, namely the AC-119G 'Shadow' and the AC-119K 'Stinger', the latter being rather more heavily armed in that it also carried a brace of 20-mm cannon in addition to four 7.62-mm (0.3-in) Miniguns. The two variants racked up an impressive record in combat, operating mainly at night and playing an important part in protecting outlying posts, which frequently came under attack from Viet Cong guerrillas and North Vietnamese regular troops during the hours of darkness. Subsequently, most of the remaining examples were handed over to South Vietnam in the early 1970s as part of the 'Vietnamization' process but, in addition to the gunships, the latter service also employed pure C-119 transports for a number of years.

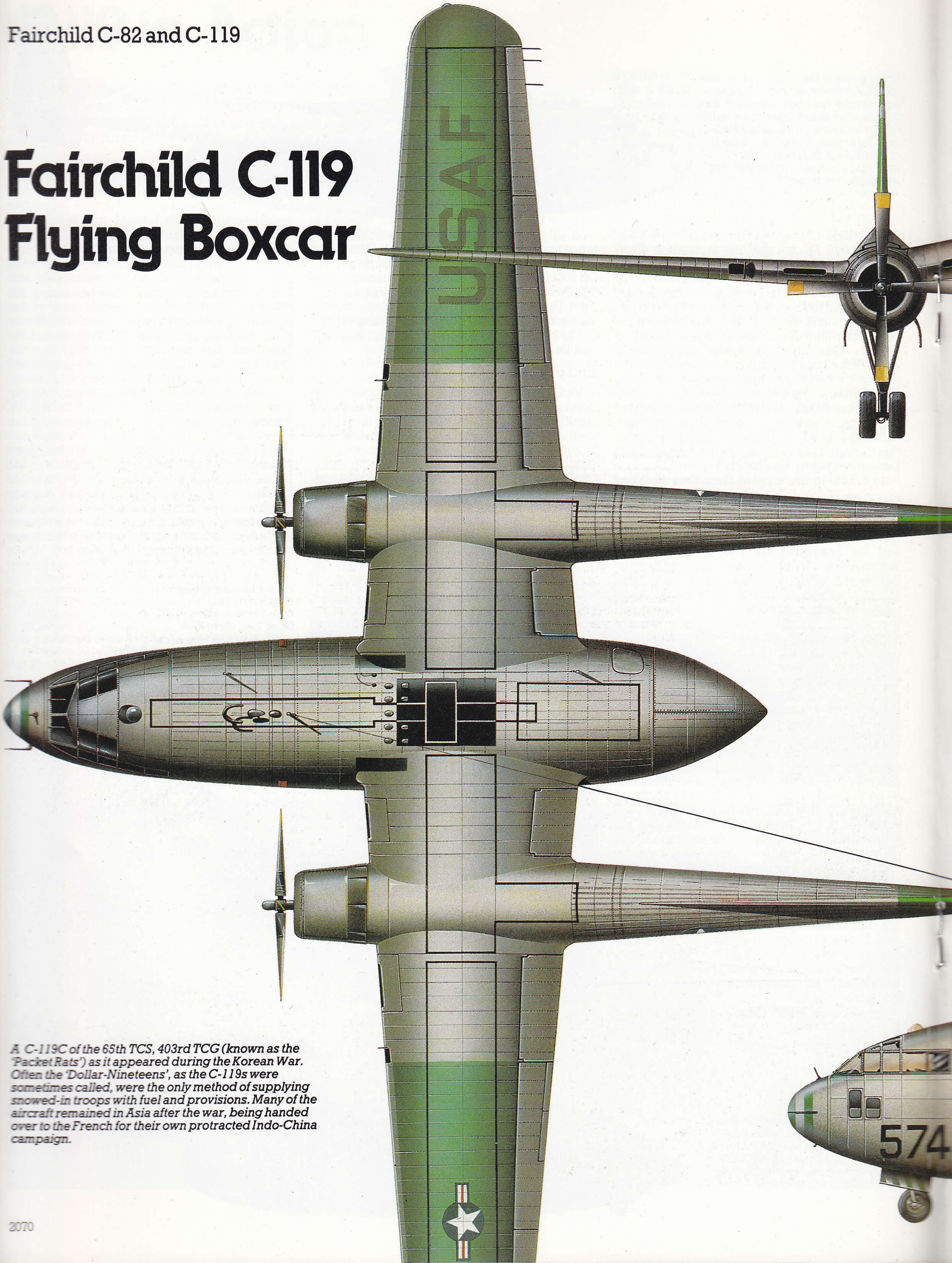
South East Asia was by no means the only part of the world where the C-119 undertook combat operations, but it was certainly the most well documented. Nevertheless, Fairchild's distinctive transport was also committed to battle in the Belgian Congo, aircraft from the Force Aérienne Belge seeing quite a bit of action in the early 1960s when that country fought to retain its colonial ties, while it is highly likely that some of the Indian Air Force's once-large fleet of C-119s played a part in the vatious conflicts with neighbouring Pakistan.

A spectacular low-level resupply mission in the Arctic demonstrates one of the advantages of the twin-boom configuration. By flying slowly at low level, barrels of fuel can simply be rolled straight out of the open rear of the aircraft to land safely in the cushioning snow.

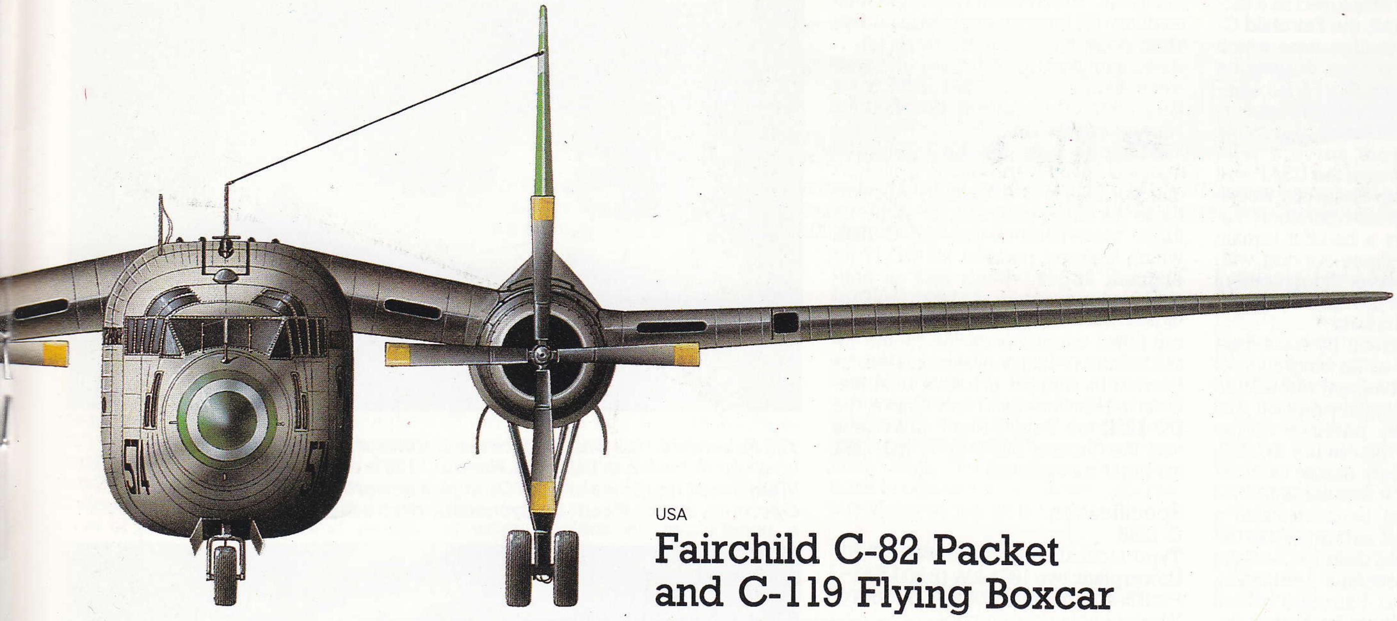
Swansong for the Packet was the conversion of some C-119s into gunships. Armed with 7.62-mm or 20-mm Gatling guns, the AC-119 Shadow was used to interdict Viet Cong supply trails.

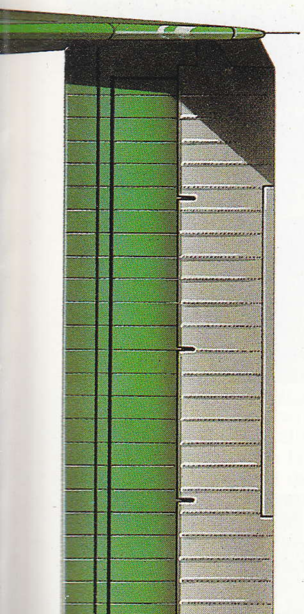


Fairchild C-119 Flying Boxcar



A C-119C of the 65th TCS, 403rd TCG (known as the 'Packet Rats') as it appeared during the Korean War. Often the 'Dollar-Nineteens', as the C-119s were sometimes called, were the only method of supplying snowed-in troops with fuel and provisions. Many of the aircraft remained in Asia after the war, being handed over to the French for their own protracted Indo-China campaign.





USA

Fairchild C-82 Packet and C-119 Flying Boxcar

With its twin tail booms, high wing and pod-type fuselage layout, the **Fairchild C-82 Packet** and **C-119 Flying Boxcar** family of tactical transports ranks high amongst the most distinctive designs ever flown, and yet the basic idea was clearly valid since both France and the UK later 'borrowed' this concept for the Nord Noratlas and Armstrong Whitworth Argosy respectively. In both of the latter cases, though, the manufacturers were unable to secure anywhere near the measure of success in terms of numbers built as did Fairchild .

Development of the C-82 Packet began during 1941 in response to a US Army Air Force request for a troop/cargo transport aircraft. The prototype **XC-82** made its maiden flight in September 1944, and for a time it looked as though both Fairchild and North American would undertake quantity production. In the event, the latter company completed only three machines, a further 997 being cancelled after VJ-Day. Fairchild, however, did produce a total of 220 **C-82A** aircraft, the last of which was handed over in September 1948, but this type was retired from the active inventory during 1954.

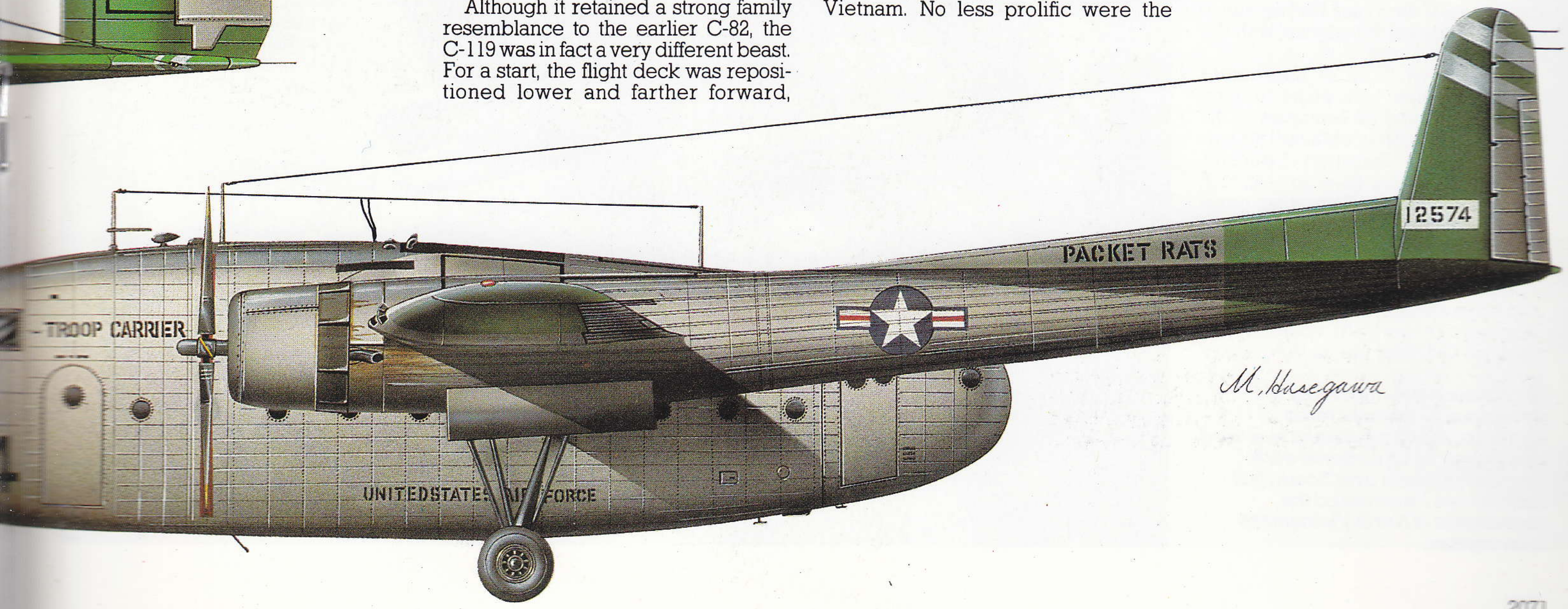
Although it retained a strong family resemblance to the earlier C-82, the C-119 was in fact a very different beast. For a start, the flight deck was repositioned lower and farther forward, while the tail section had also been redesigned. In addition, the Pratt & Whitney R-2800 piston engines of the C-82 had been replaced by more powerful Pratt & Whitney R-4360 engines and, on production aircraft at least, the fuselage was slightly wider which permitted a greater payload. Following evaluation of a converted C-82 as the **C-119A** in 1947-8, the new version was ordered into prodution as the **C-119B** although this very quickly gave way to the **C-119C**, close to 360 of these two models being completed.

Further changes to the means of propulsion were introduced by the **C-119F**, which was powered by a pair of Wright R-3350 radial engines, 199 being produced before the definitive **C-119G** made its debut. This again was powered by Wright R-3350 engines and it eventually became the most numerous member of the Fairchild line, 480 C-119Gs having been completed by the time manufacture terminated towards the end of 1955.

In addition to service with the USAF, the Flying Boxcar proved popular with overseas air arms, examples being delivered to friendly nations such as Belgium, Canada, Ethiopia, India, Italy, Morocco, Norway, Taiwan and South Vietnam. No less prolific were the number of variants which appeared at a later date, these including the **AC-119G/K** 'gunships', the **C-119J** with clamshell-type rear loading doors and the **JC-119** for satellite capsule recovery tasks. Despite the fact that it is now rather long in the tooth, some examples of the C-119 are still active in India, while it is thought that Taiwan also retains this type as part of its airlift inventory.

Specification
C-119G

Type: tactical transport aircraft
Powerplant: two 3,400-hp (2535-kW) Wright R-3350-89W air-cooled radial piston engines
Performance: maximum speed 476 km/h (296 mph) at 5182 m (17,000 ft); cruising speed 322 km/h (200 mph); range with standard fuel 3669 km (2,280 miles)
Weights: empty 18136 kg (39,982 lb); maximum take-off 33747 kg (74,400 lb)
Dimensions: span 33.30 m (109 ft 3 in); length 26.37 m (86 ft 6 in); height 8.03 m (26 ft 4 in); wing area 130.06 m^2 (1,400 sq ft)



USA

Fairchild C-123 Provider

Although primarily employed as a tactical transport aircraft, the **Fairchild C-123 Provider** was another type which really came into its own during the course of the Vietnam War. A substantial number of the twin-engine general-purpose freighter/troop transports were rescued from service with second-line elements of the USAF and despatched to South East Asia where they served with great distinction. Today, however, only a handful remain on USAF charge, these serving with the Air Force Reserve, though others are still active with the air arms of the Philippines and Thailand.

Originally conceived by the Chase Aircraft Company as an outgrowth of that concern's involvement with assault cargo gliders, the initial proposal was known in company parlance as the **MS-8 Avitruc** and this, as the **XC-123**, made its maiden flight during October 1949. In the event, it was not until 1952 that USAF interest hardened into a contract for five test airframes, but the parent company was destined never to place the type in quantity production, the task falling to Fairchild which assumed responsibility for further development and production of the aircraft towards the end of 1953.

Following some redesign, which included the addition of a prominent dorsal fin, Fairchild's first **C-123B** got airborne at the beginning of September 1954, this being the forerunner of 302 aircraft, most of which found their way into the Tactical Air Command inventory, although six went to Saudi Arabia and 18 were delivered to Venezuela.

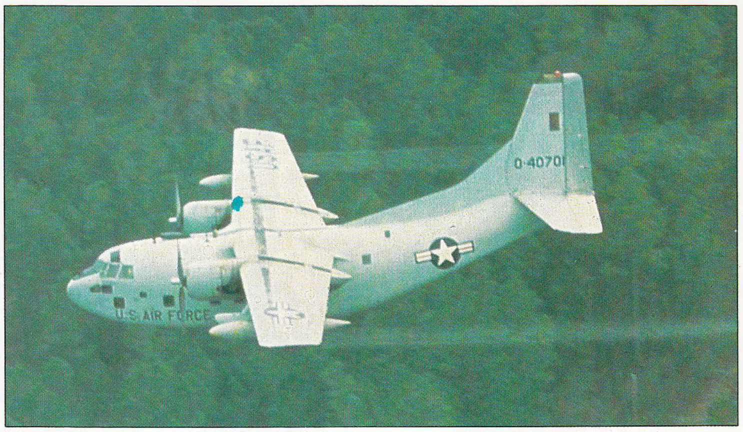
Only three other aircraft were built as new, these all being one-off airframes for evaluation. The **YC-123D** came first, this incorporating boundary layer control for enhanced STOL performance, and this was followed by the **YC-123E**, complete with 'Pantobase' fuselage undersides which permitted operation from water. Finally, there was the **YC-123H** with wide-track landing gear, rough-field tyres and two auxiliary J85 turbojet engines in underwing pods. None of these three types was committed to production, although some features of the YC-123H were later adopted by aircraft destined for service in Vietnam.

Although only the basic C-123B attained quantity production, numerous variants did eventually appear, these all being conversions of the C-123B. Most notable was the **C-123K** which featured podded J85-GE-17 jet engines, larger wheels and an anti-skid braking system. At least 180 Providers were updated to this standard, but other variations on the theme included the **C-123J** with skis and jets for service in support of DEW Line stations in Newfoundland and Alaska, the **UC-123K** for 'Ranch Hand' defoliation and the 'Project Black Spot' **NC-123K** for night surveillance.

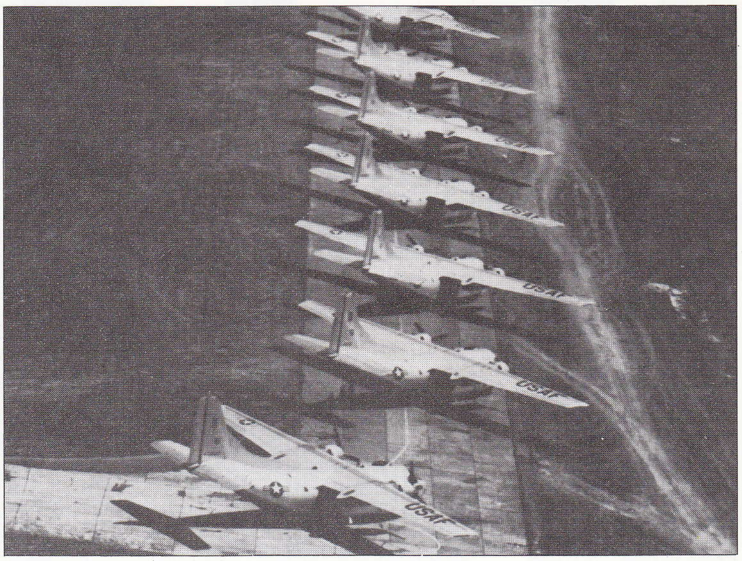
Specification

C-123B

Type: tactical transport aircraft
Powerplant: two 1864-kW (2,500-hp) Pratt & Whitney R-2800-99W Double Wasp radial piston engines
Performance: maximum speed 394 km/h (245 mph); cruising speed 330 km/h (205 mph); service ceiling 8839 m (29,000 ft); range 2366 km (1470 miles)
Weights: empty 13562 kg (29,900 lb); maximum take-off 27216 kg (60,000 lb)
Dimensions: span 33.53 m (110 ft 0 in); length 23.24 m (76 ft 3 in); height 10.39 m (34 ft 1 in); wing area 113.62 m^2 (1,223 sq ft)



The Fairchild C-123 was used for a multitude of tasks during the US involvement in South East Asia. Here a C-123 is employed in spraying the Vietnamese jungle with Agent Orange, a powerful defoliant, during Operation 'Ranch Hand', the systematic destruction of potential VC cover.



The pressure of the Vietnam War led to vast numbers of C-123s, hitherto languishing in reserve, being rushed into front-line service. This formation of C-123s is at South Vietnam's Tan Son Nhut air base prior to the attempt to burn down the guerrilla sanctuary in Boi Loi forest.

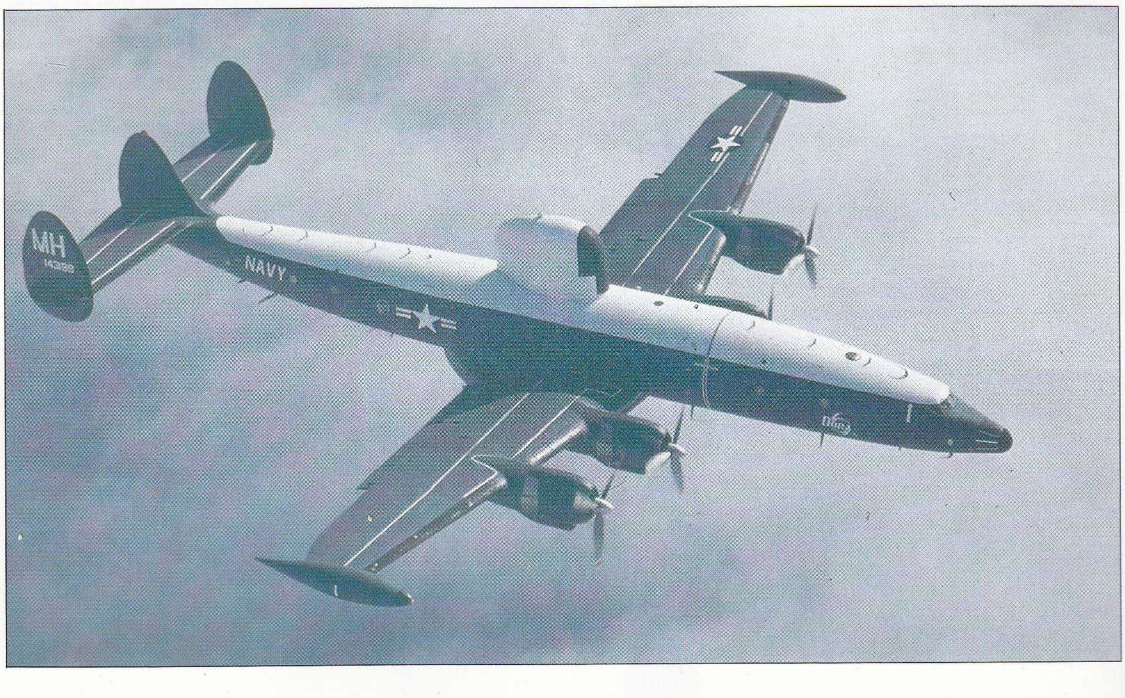
USA

Lockheed C-69 and C-121 Constellation

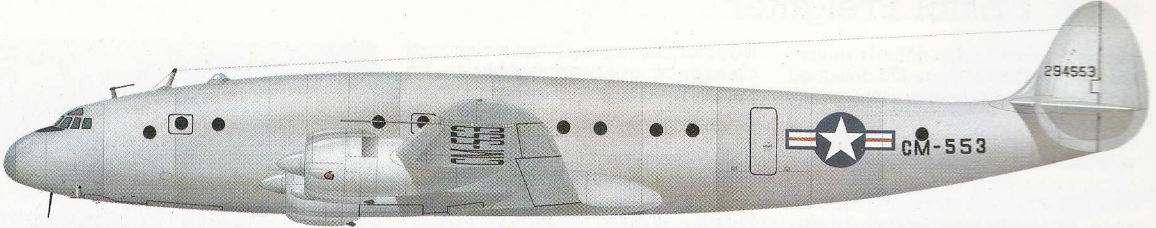
As was the case with the Douglas C-54 Skymaster, so did the **Lockheed Constellation** find its way into military uniform as more or less an accident of history, aircraft on the production line at the time of the Pearl Harbor attack being impressed for service with the US Army Air Force.

The maiden flight of Lockheed's graceful 'Connie' took place in early January 1943, and 22 examples of the **C-69** were ultimately obtained for service with the Air Transport Command, these pressurized 64-seater aircraft being employed mainly as troop transports during the war years before being sold to commercial airlines with the return of peace.

Subsequently, in 1948, 10 examples of the improved **L-749** version were purchased by the USAF under the designation **C-121** for use as VIP/person-



Its graceful lines marred by the addition of prominent radar housings, the Constellation was used extensively as an airborne early warning platform over South East Asia, where it monitored the movements of North Vietnamese interceptors.



Constellations were used as troop transports in the last two years of World War II before being sold to commercial airlines. Both the US Navy and Air Force purchased C-121s during the 1950s, but the last Constellations to see active service were those of the Indian Navy; these survived into the 1980s.

nel transports, one of these finding its way into service as a presidential aircraft with the name *Columbine II*. Other pure transport examples based on the commercial **L-1049** followed in 1954, 33 **C-121C** aircraft being ordered for the Military Air Transport Service whilst US Navy airlift capability was significantly updated through the acquisition of about 50 **R7V-1** (later **C-121J**) aircraft, 32 of which were eventually transferred to MATS as **C-121G** machines. In addition, four examples of the YT-34 turboprop-powered **R7V-2** version were delivered to the US Navy, and two of these also saw service with the USAF under the designation **YC-121F**.

Although extensively used as a transport aircraft, the Lockheed type was perhaps best known by the military as the **Warning Star** airborne early warning platform, both the US Navy and US Air Force acquiring large numbers of the **RC/EC-121** models. Addition of prominent dorsal and ventral fairings housing mission-related radar, whilst unsightly, could not disguise the Constellation's classic lines, and these proved to be the longest-lived examples of the breed. Employed initially to augment ground-based radar coverage of the continental USA, the type was soon committed to action in South East Asia by the USAF, which employed it to detect MiG activity over North Vietnam and to exercise command and control of friendly strike forces. US Navy EC-121s were also active in this part of the world, although they were confined mainly to the acquisition of electronic intelligence, a potentially dangerous mission and one which resulted in aircraft coming under attack from hostile fighters from time to time, most notably those of North Korea.

In addition to the USA, examples of the Constellation also served with the air arms of India and Indonesia, the former's Naval Air Service employing a number of ex-Air India passenger transports on maritime surveillance until quite recently, these almost certainly being the last Super Constellations to operate in a military capacity anywhere in the world.

Specification
C-121G

Type: long-range transport aircraft

Powerplant: four 3,250-hp (2424-kW) Wright R-3350-91 Turbo-Compound radial piston engines

Performance: maximum speed 592 km/h (368 mph) at 6096 m (20,000 ft); cruising speed 417 km/h (259 mph) at 3048 m (10,000 ft); service ceiling 6797 m (22,300 ft); range 3380 km (2,100 miles)

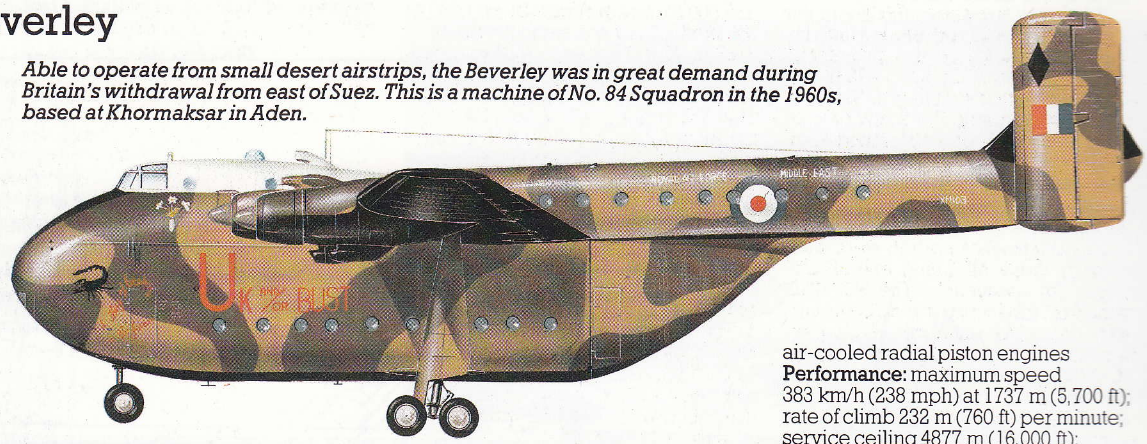
Weights: empty 33028 kg (72,815 lb); maximum take-off 65771 kg (145,000 lb)

Dimensions: span 37.49 m (123 ft 0 in); length 35.41 m (116 ft 2 in); height 7.52 m (24 ft 8 in); wing area 153.29 m² (1,650 sq ft)

UK

Blackburn Beverley

Able to operate from small desert airstrips, the Beverley was in great demand during Britain's withdrawal from east of Suez. This is a machine of No. 84 Squadron in the 1960s, based at Khormaksar in Aden.



Making its debut in 1950, the **General Aircraft G.A.L. 60** was the largest transport of its kind to be produced in the UK, and the military freighter which was based on this after the merger with the Blackburn organization became known as the **Blackburn Beverley**.

The prototype first flew three years later, in mid-June, and a contract for 20 **Beverley C.Mk 1** transports was placed, the type duly becoming the biggest aircraft then to be flown by the RAF. Delivery of production models began in 1955.

A further claim to history by the type was that it was specially designed not only for dropping paratroops, but also for delivery by the same means of motor vehicles. These were supported on special pallets and rolled out of the rear of the main cargo hold, the exit created by removal of the clamshell doors for these missions, the cavernous accommodation for such loads being separate from the passenger seating in the boom above. Maximum payload was 25297 kg (55,770 lb). It follows therefore that the Beverley was also of use in such tasks as supporting ground forces and casualty evacuation (48 litters and six attendants) roles where its remarkably short take-off and landing runs of 740 m (2,430 ft) and 320 m (1,050 ft) respectively proved of great value.

No. 47 Squadron was the first to be equipped with the Beverley, in March 1956 while based at Abingdon, and as further machines were taken on charge some unique duties came its way. These included the delivery of Bristol Sycamore and Westland Whirlwind helicopters to Cyprus, while the first year of its use also saw the dropping of a record load for the time, namely one of 10886 kg (24,000 lb) with the aid of several 20-m (66-ft) diameter parachutes. One of the Beverley's lesser records is the fact that it was the last powered aircraft to land at RAF Hendon, north of London, for the example of the type which now stands on exhibition there beside the RAF Museum was delivered under its own power.

Specification
Beverley C.Mk 1

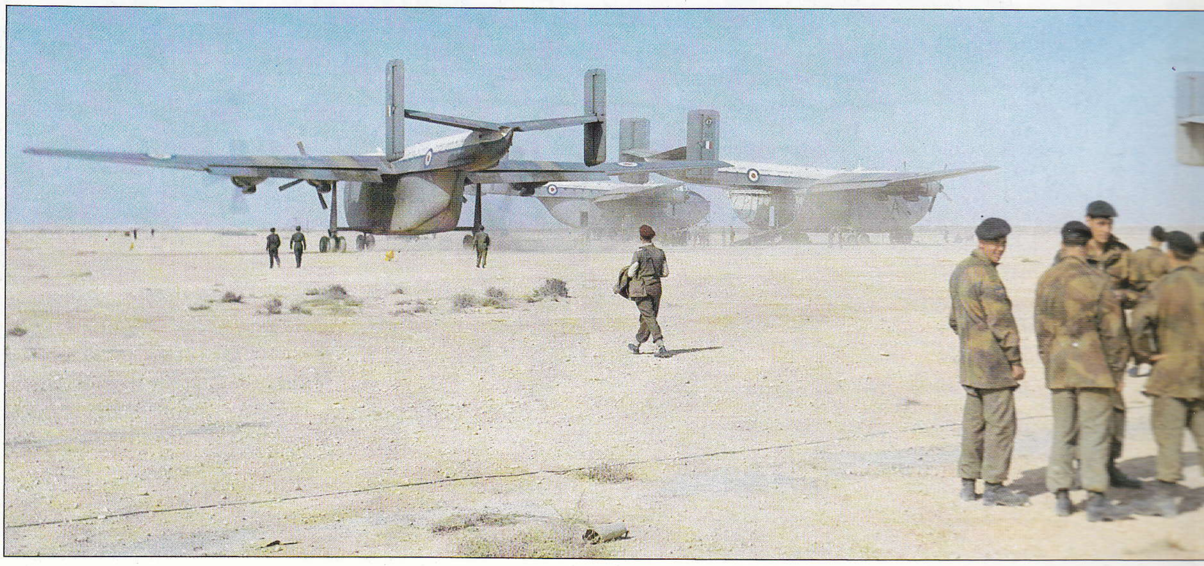
Type: medium-range transport for freight, 94 troops or 70 paratroops

Powerplant: four 2125-kW (2,850-hp) Bristol Centaurus 173 or Centaurus 663 air-cooled radial piston engines

Performance: maximum speed 383 km/h (238 mph) at 1737 m (5,700 ft); rate of climb 232 m (760 ft) per minute; service ceiling 4877 m (16,000 ft); range 370 km (230 miles) with a 22680-kg (50,000-lb) load

Weights: empty 35938 kg (79,230 lb); maximum take-off 61235 kg (135,000 lb)

Dimensions: span 49.38 m (162 ft 0 in); length 30.30 m (99 ft 5 in); height 11.81 m (38 ft 9 in); wing area 270.90 m² (2,916 sq ft)



These Beverleys belong to No. 47 Squadron, the first unit to receive the aircraft in March 1956. Beverleys were designed to drop vehicles as well as parachutists by the clumsy expedient of removing the clamshell doors at the rear of the fuselage.

UK

Bristol Freighter

Making its debut as an entirely private venture, the **Bristol Type 170** designed in 1944 was recognized as a type which answered to the requirements of General Wingate for the movement of vehicles and supplies in the Burma campaign. Two prototypes were ordered with enlarged fuselages capable of accepting army trucks, although the prototype was too late to see war service, not flying until December 1945.

The **Type 170 Mk 31M** was the military transport version of the production Mk 31 Freighters and civil Mk 31E Wayfarers, and saw service in the air forces of Canada, New Zealand, Australia and Pakistan. The last took 38 of this variant between December 1953 and June 1955 and used them mainly in mountainous areas for supply-dropping, although five were fitted in 1961 for anti-locust operations with spray-booms added. Military versions as a whole represented the largest single contract for the type. Of these, probably unique was the pair prepared specially for VIP use in Pakistan, the twin rows of 10 double seats of the original design being reduced to give more space in the luxurious cabin.

While the large opening doors that formed the nose had obvious advantages for military work, the low ground clearance enabled freight to be loaded with the aid of only a moderate ramp. A novel feature for a transport of the period was the large fixed landing gear, which not only eliminated the necessity for complex hydraulics and consequently eased maintenance in the field, but also permitted operation from rough terrain; the electro-hydraulics incorporated for flap and door operation were comparatively simple.

At one time or another Iraq and Burma have also used the military freighter, but unusual were some of the 12 in use by the RNZAF. Not only did these maintain a continuous presence in Singapore for 22 years, operated by No. 41 Squadron, but for a period some were lent to the domestic airline SAFE.

Specification

Type 170 Mk 31M

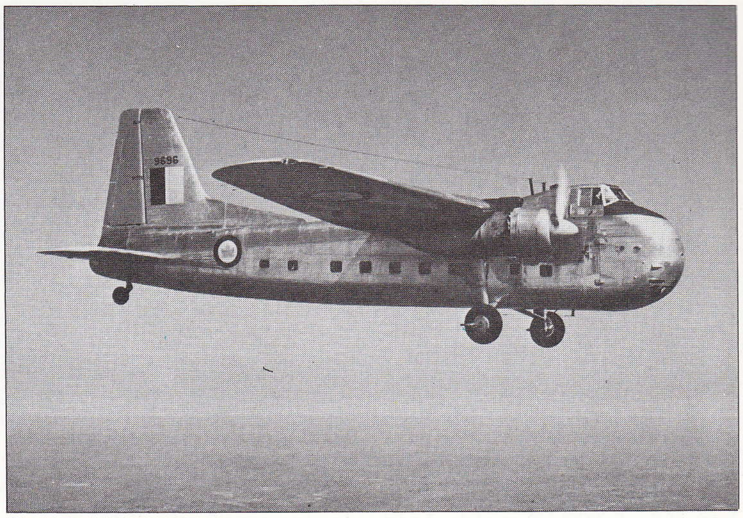
Type: military transport

Powerplant: two 1491-kW (2,000-hp) Bristol Hercules 734 air-cooled radial piston engines

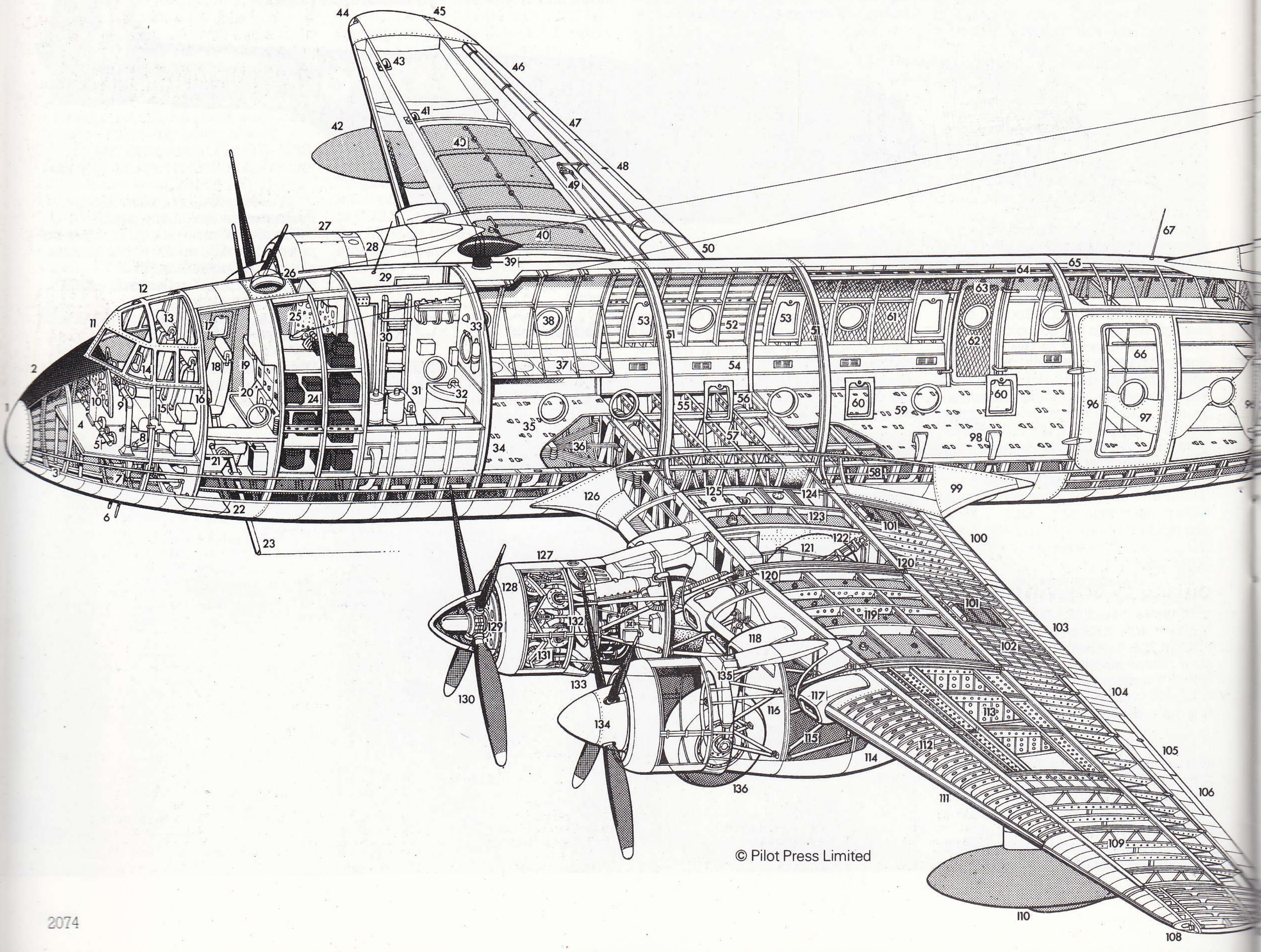
Performance: maximum speed 311 km/h (193 mph) at 3048 m (10,000 ft); rate of climb 421 m (1,380 ft) per minute; service ceiling 7468 m (24,500 ft); range 676 km (420 miles)

Weights: empty 11452 kg (25,247 lb); maximum take-off 19958 kg (44,000 lb)

Dimensions: span 32.92 m (108 ft 0 in); length 20.83 m (68 ft 4 in); height 6.60 m (21 ft 8 in); wing area 138.14 m^2 (1,487 sq ft)



The Bristol Freighter was unusual in having large fixed landing gear, which eliminated the need for complex hydraulics and made for easy maintenance. Bristol Freighters were widely exported, serving with the armed forces of Canada, New Zealand, Pakistan and Australia.



© Pilot Press Limited

UK

Handley Page Hastings

The Avro York transports that had been standard long-range freighters for the RAF were eventually replaced by a product from Handley Page, which had long been associated with large aircraft. The new machine flew for the first time in its production version during the spring of 1947, almost exactly a year after the maiden flight of the prototype. This was the **Handley Page Hastings C.Mk 1**, differing from the **Hastings C.Mk 2** in having a higher-mounted, short-span tailplane and reduced fuel capacity; some of the first production versions were retrospectively modified to the later standard as **Hastings C.Mk 1A** aircraft.

It was the earlier variant that in October 1947 equipped the first Transport Command squadron to have the type, No. 47 at Dishforth, so that together with No. 297 Sqn it was in time to see service in Operation 'Plainfare', the Berlin Airlift. Hastings transports were employed on this supply run to the former German capital until the end of the first week in October 1949.

A year later the modified Hastings C.Mk 2 was introduced, this version remaining in production for the next two years, and simultaneously four of the **Hastings C.Mk 4** VIP variant were delivered.

The standard model was used not only at home as a transport and for meteorological reconnaissance, but also in the Middle East and Far East, acting as freighter on established trunk routes and as supply droppers, or for the movement of 50 troops each, or the dropping of 30 parachutists from a single aircraft. Thus the Hastings qualified for participation in the second largest air lift to take place after that to Berlin, that of 1958 which moved stores, men, vehicles and equipment from the UK to Cyprus. This was in July after King Hussein's public invitation to intervene in the crisis that followed the revolution in Iraq, when that kingdom broke with Jordan after the dissolution of the Arab Federation in the previous February.

Specification

Hastings C.Mk 2

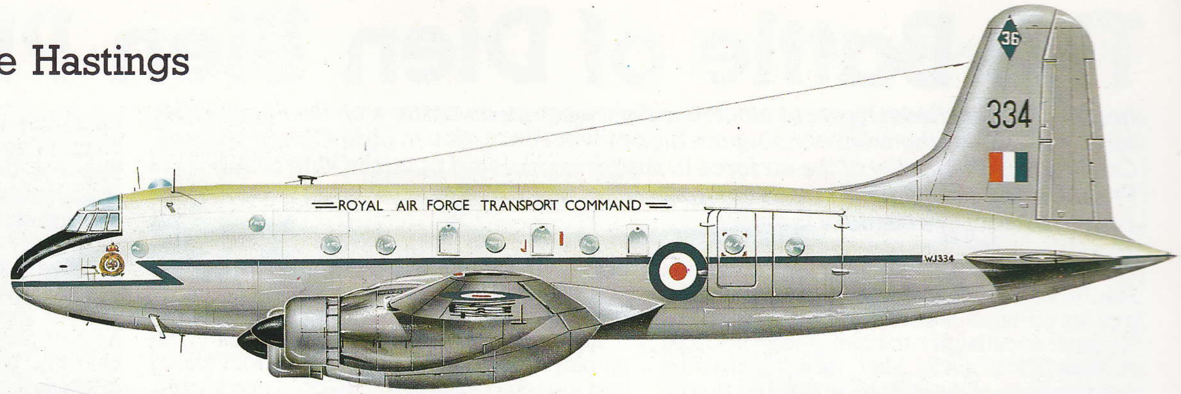
Type: long-range transport

Powerplant: four 1249-kW (1,675-hp) Bristol Hercules 106 air-cooled radial piston engines

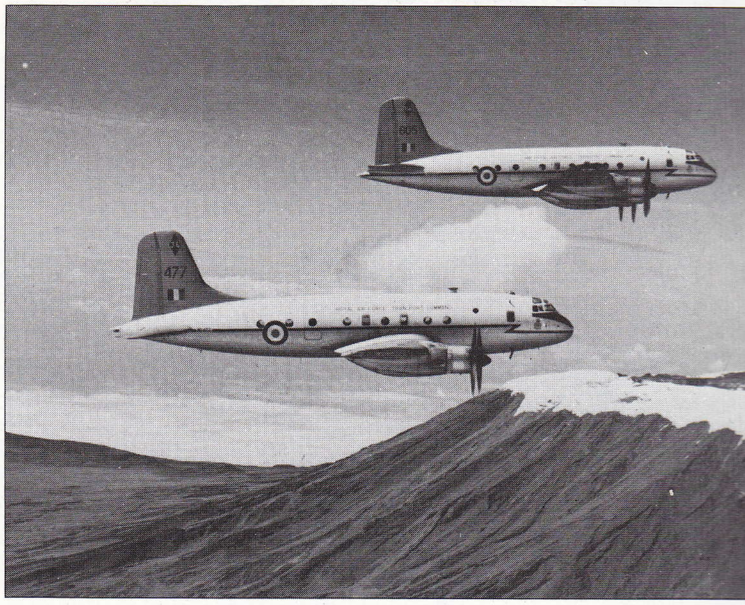
Performance: maximum speed 560 km/h (348 mph) at 6767 m (22,200 ft); rate of climb 271 m (890 ft) per minute; service ceiling 8077 m (26,500 ft); range 2720 km (1,690 miles)

Weights: empty 21966 kg (48,427 lb); maximum take-off 36287 kg (80,000 lb)

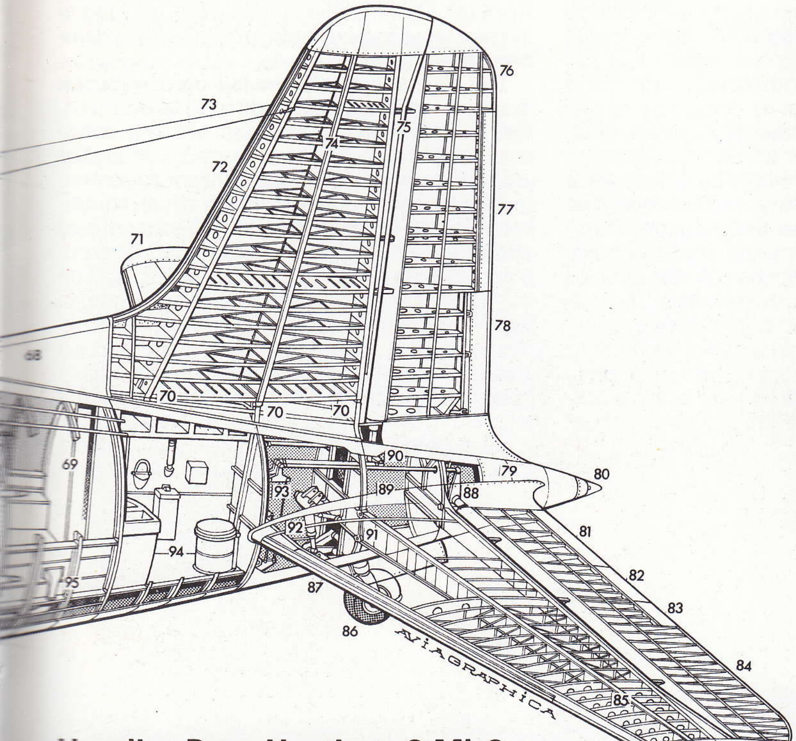
Dimensions: span 34.44 m (113 ft 0 in); length 25.20 m (82 ft 8 in); height 6.86 m (22 ft 6 in); wing area 130.8 m^2 (1,408 sq ft)


36
334
ROYAL AIR FORCE TRANSPORT COMMAND
WJ334

The Handley Page Hastings entered service in the late 1940s. This Hastings C.Mk 2 was flown by No. 36 Squadron, RAF, which operated the type until 1967, when the Hastings was replaced by Lockheed's C-130 Hercules.



Hastings from Nos 36 and 114 Squadrons fly over the snows of Kilimanjaro. Probably dating from about 1960, the photo shows both C.Mk 1 and C.Mk 2 Hastings, the nearer aircraft being the Mk 2 (the difference in tailplane positions being most noticeable).



Handley Page Hastings C.Mk 2 cutaway drawing key

1 Nose cone
2 Anti-glare panel
3 Downward vision windows
4 Pilot's floor level
5 Rudder pedals
6 Rebecca transmitter aerials
7 Underfloor control linkages
8 Rebecca receiver aerial
9 Control column
10 Instrument panel
11 Windscreen panels
12 Cockpit roof glazing
13 Co-pilot's seat
14 Direct vision window
15 First pilot's seat
16 Flight deck bulkhead
17 Cockpit escape hatch
18 Navigator's seat
19 Flight engineer's seat
20 Radio operator's console
21 Trailing aerial winch
22 Ventral crew-entry hatch
23 Trailing aerial mast
24 Radio and electronics racks
25 Flight engineer's console
26 Astrodome observation hatch
27 Starboard outer engine nacelle
28 Whip aerial
29 Crew toilet on starboard side
30 Boarding ladder, stowed
31 Air Quartermaster's station
32 Wash basin
33 Cabin bulkhead
34 Plymax cabin flooring panels
35 Cargo tie-down points
36 Control cable runs
37 Folding paratroop seats, 30 paratroops
38 Cabin windows
39 DF loop aerial
40 Starboard wing fuel tanks, maximum internal fuel capacity 3,172 Imp gal (14420 litres)
41 Retractable landing lamp
42 Auxiliary long-range fuel tank
43 Retractable taxiing lamp
44 Starboard navigation light
45 Rearward identification lights
46 Starboard aileron
47 Aileron trim tab
48 Spring tab
49 Aileron hinge controls
50 Starboard outer slotted flap
51 Wing attaching fuselage main frames
52 Fuselage frame and stringer construction
53 Starboard escape hatches, three per side
54 Cabin trim panels
55 Hydraulic fluid reservoir
56 Air bottle
57 Floor beam construction
58 Underfloor freight hold
59 Rear cargo floor
60 Port escape hatches
61 Cabin soundproofing linings
62 Starboard paratroop door
63 Paratroop static line attachments
64 Overhead cargo lashing rail
65 Fuselage skin plating
66 Air ambulance version stretcher carrier, total of 32 stretchers
67 Whip aerial
68 Fin roof fillet
69 Cabin rear bulkhead
70 Fin spar attachments
71 Starboard tailplane
72 Fin leading-edge fluid de-icing
73 Aerial cables
74 Fin construction
75 Rudder hinge post
76 Rudder construction
77 Trim tab
78 Rudder spring tab
79 Tailcone
80 Rear navigation light
81 Elevator spring tab
82 Trim tab
83 Balance tab
84 Elevator construction
85 Port tailplane construction
86 Retractable tailwheel
87 Tailplane leading-edge fluid de-icing
88 Elevator hinge control
89 Tailwheel bay
90 Rudder hinge control
91 Tailplane main spar attachment
92 Tailwheel retraction mechanism
93 Tailplane control runs
94 Passenger toilet compartment
95 Rear cabin heater duct
96 Double freight doors
97 Port paratroop/passenger door
98 Main cabin heater ducts
99 Wing trailing edge root fillet
100 Inboard slotted flap
101 Dinghy bays
102 Trailing edge flap shroud ribs
103 Port outer slotted flap
104 Port aileron
105 Aileron spring tab
106 Trim tab
107 Rearward identification lights
108 Port navigation light
109 Wing rib construction
110 Port auxiliary fuel tank
111 Leading-edge fluid de-icing
112 Leading-edge nose ribs
113 Outer wing fuel tank bays
114 Port outer engine nacelle
115 Nacelle support struts
116 Engine bearers
117 Injection air intake
118 Oil cooler intake
119 Interplane fuel tanks
120 Interplane spar pin joints
121 Main undercarriage wheel well
122 Retraction jack
123 Inboard fuel tank
124 De-icing fluid tank
125 Oil tank
126 Leading-edge fillet
127 Port inner engine nacelle
128 Engine cowling ring
129 Propeller hub pitch change mechanism
130 de Havilland four-bladed constant speed propellers
131 Bristol Hercules 106 air-cooled 14-cylinder two-row radial engine
132 Exhaust stubs
133 Cooling air exit flaps
134 Propeller spinner
135 Main undercarriage leg strut
136 Port mainwheel

The Battle of Dien Bien Phu

In 1953 Général Henri Navarre elected to fight a set-piece battle with the elusive Viet Minh guerrillas who were winning the bloody war of attrition in Indo-China. Confident of the ability of the air force to supply an isolated post, the elite of the French army parachuted into a remote valley in North Vietnam for what was to prove the decisive battle of the war.

The decision to take the village of Dien Bien Phu on the Vietnam/Laos border and to occupy it as an 'air-head' was taken by Général Henri Navarre, commander-in-chief of French forces in Indo-China since May 1953, against the strong advice of the man he appointed to control the operation, Général de Division René Cogny. Cogny was sure that the location could form only a 'mooring-point' for large-scale patrolling throughout the area, rather in the manner of the Chindit strongholds of 1944 in Burma, and the disaster which followed was due to a great extent to this fundamental divergence of view. It was compounded by a gross underestimate of the capability of the enemy commander, General Vo Nguyen Giap, to concentrate Viet Minh forces in the area at speed, and to keep them supplied with heavy weapons and their ammunition.

Two of Cogny's parachute battalions were dropped into the valley from Douglas C-47s on the morning of 20 November 1953, and after a brisk battle there with the surprised Viet Minh troops, occupied the village during that afternoon. Three more parachute battalions and a command headquarters were dropped in within four days, and the tasks of lengthening and reinforcing the existing airstrip and digging field defences was going well. In those early days it looked as though Operation 'Castor' could be successful.

But by the beginning of December the basic divergence of view at command level was already indicating problems ahead. A new garrison commander, the elegant cavalry officer Colonel Christian de la Croix de Castries, was dropped in with orders both to turn Dien Bien Phu into a fortress to be held 'without thought of withdrawal', and at the same time to employ at least half his strength in offensive forays. This would not only dominate the valley in which the village lay, but also drive the enemy off at least the lower foothills around, and link up with other French forces across the border in Laos.

But if half de Castries' strength was to be employed outside the perimeter, who would turn the temporary field defences into fortfied strongpoints? Especially as the 80 C-47s available could fly in only 150 tons of supplies per day, and their first priority was food and ammunition, while the engineers' requirement to turn the place into a fortress was 30,000 tons of concrete, steel sheets, generators etc., of which 3,000 tons was for barbed wire alone. Even the welcome addition to the transport fleet of some Fairchild C-119 Flying Boxcars flown by civilian pilots and crewed by American volunteers did not help the sappers much, for the transports were used mostly for flying in heavy artillery and shells, together with some M24 Chaffee light tanks, the teams and equipment for two surgical units and a pair of field brothels.

Large defence force

But there was to be no shortage of men to defend Dien Bien Phu, however flimsy might be their shelters. During the weeks that followed de Castries' strength increased to 10,814 men, the combat battalions consisting of two native T'ai battalions, three of Algerian *tirailleurs* and one of Moroccan, and four Foreign Legion battalions. If the native battalions were not of the highest military competence, the Algerians and Moroccans were to prove themselves of superb quality, while a high percentage of the Foreign Legionnaires had learned their soldiering with the Afrika Korps. The vast majority of the officers were, of course, French.

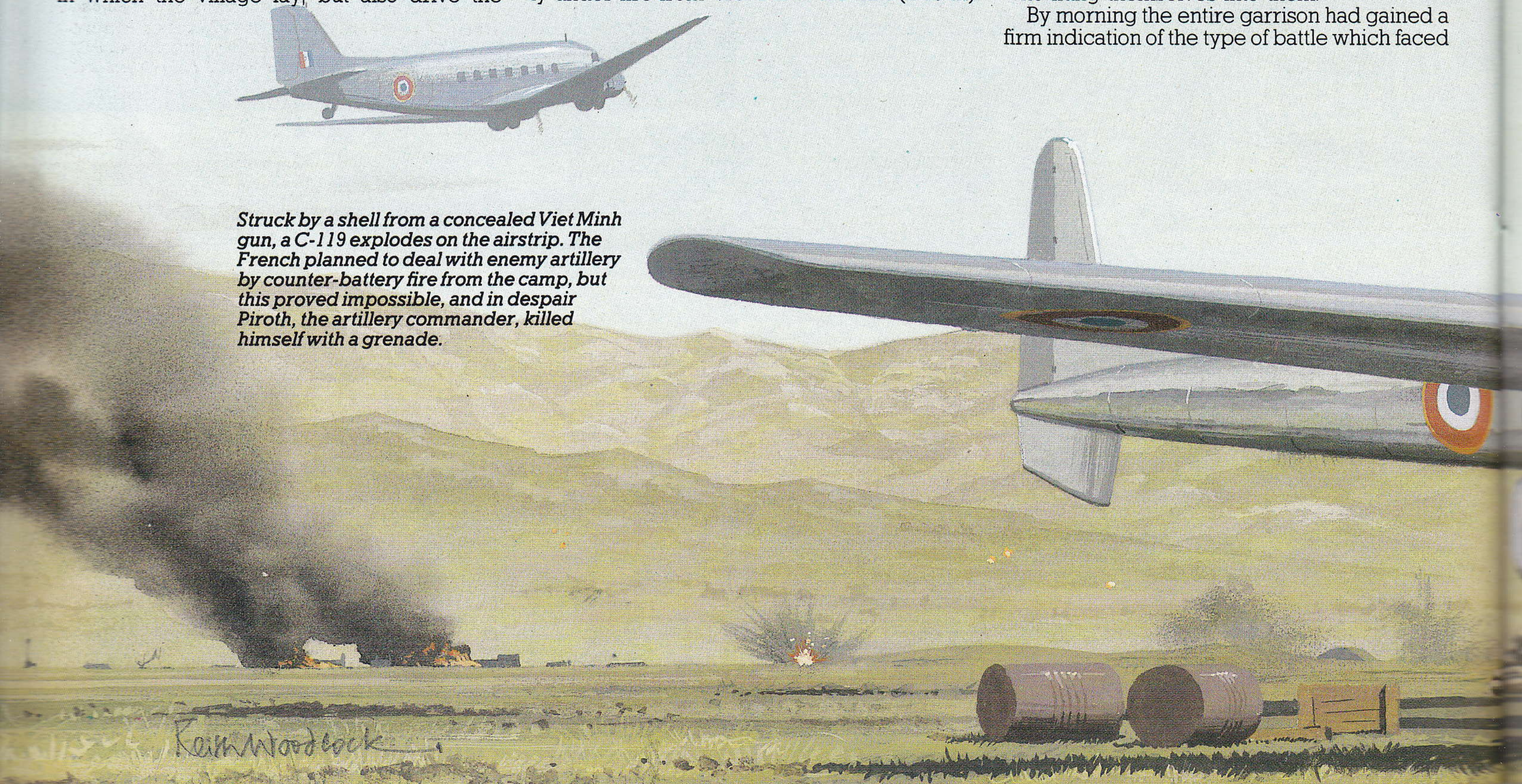
But already the garrison was suffering casualties. To the astonishment of both Navarre and de Castries, the landing-strip came quickly under fire from Viet Minh 105-mm (4.13-in) guns, and the weight of fire coming into the camp increased ominously as the weeks passed, as did its accuracy. As every tree, shrub or even bush was stripped from the valley floor to provide either fuel or cover for the defence, the entire lay-out of the garrison was revealed to observers on the surrounding hills, and the observers had been there since the first day.

Even more ominously, by February anti-aircraft guns had arrived in the foothills, and very shortly afterwards both C-47 and C-119 pilots were told that they must drop their cargoes from 2000 m (6,560 ft) instead of 600 m (1,970 ft). Eleven Grumman Bearcat fighters were flown in to give them some form of protection when they arrived over the dropping zones.

But Giap was already assembling a striking force against the French in Dien Bien Phu, far more numerous and far better armed and supplied than the French command had ever dreamed possible. By the beginning of March three Viet Minh infantry divisions comprising 28 battalions were in position with their supporting arms, and also the 351st Heavy Division with 48 105-mm howitzers, 48 75-mm (2.95-in) guns, and the same number of 120-mm (4.72-in) mortars and 75-mm recoilless rifles. Anti-aircraft weapons of every calibre were arriving with each day that passed, and by mid-April the C-119 civilian pilots were refusing to fly over what had become known as 'the chamber-pot'.

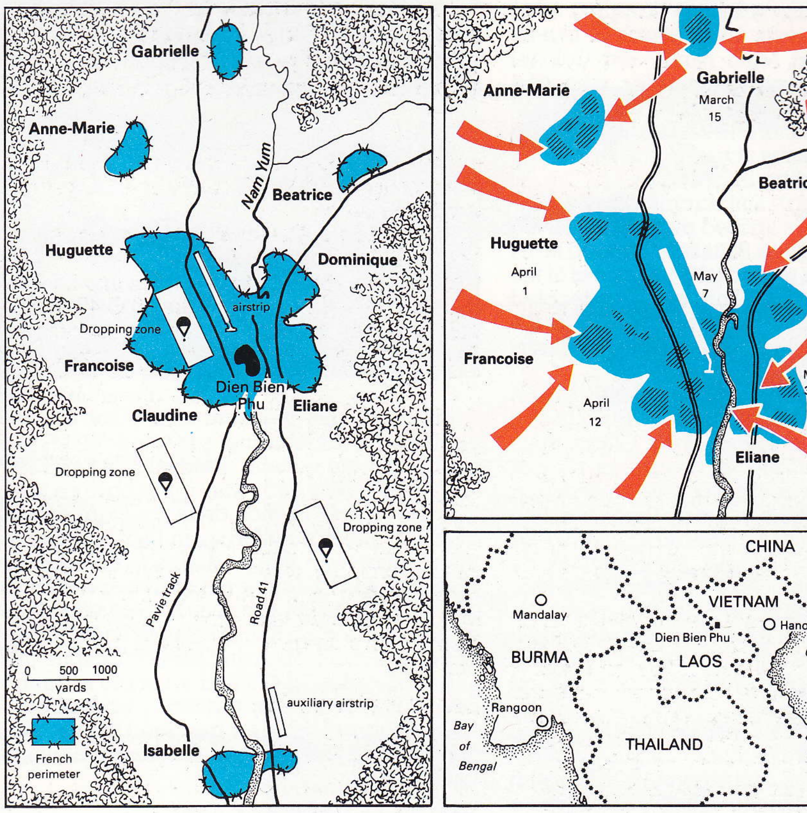
The first, stunning blow fell on the French during the evening and night of 13 March 1954. Heavy and accurate fire deluged the entire area, blowing in shelters, smashing trenches and gun positions, setting alight every aircraft except three fortunate Bearcats which scrambled during the first minute of the attack and were then forced by the almost total destruction of the airstrip to fly back to Hanoi. And on the heels of the bombardment came a 'human wave' infantry assault delivered with supreme disregard for casualties, in which the barbed wire defences were blown apart by explosive charges attached to the bodies of the soldiers who flung themselves into them.

By morning the entire garrison had gained a firm indication of the type of battle which faced



Struck by a shell from a concealed Viet Minh gun, a C-119 explodes on the airstrip. The French planned to deal with enemy artillery by counter-battery fire from the camp, but this proved impossible, and in despair Piroth, the artillery commander, killed himself with a grenade.

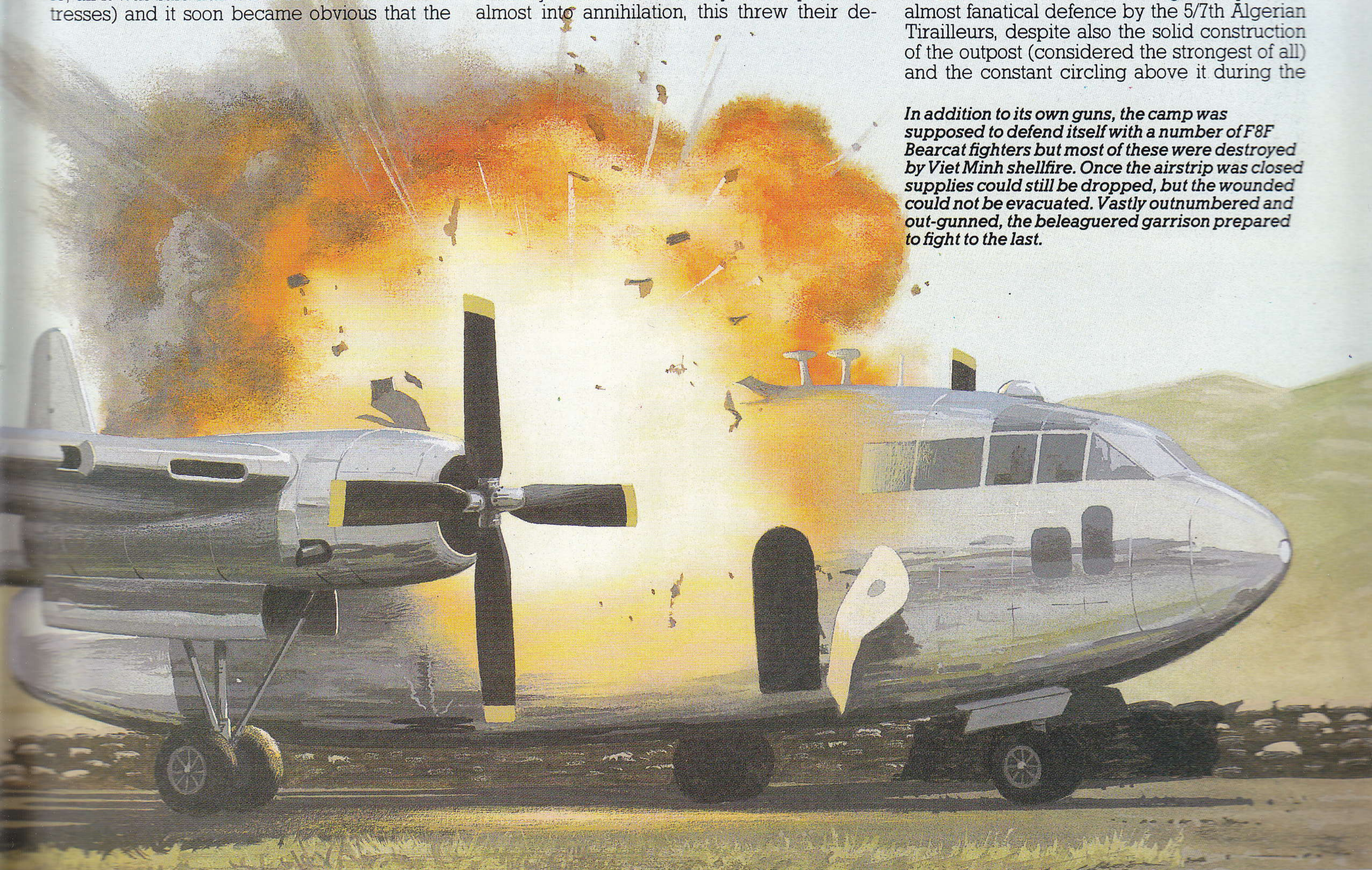
Above: Unimpressed by the leadership of their commander, de Castries, the battle-hardened paratroop colonels seized command of the doomed fortress and prepared for the inevitable last stand.


Gabrielle
Anne-Marie
Nam Yum
Beatrice
Huguette
Dominique
airstrip
Dropping zone
Francoise
Dien Bien Phu
Claudine
Eliane
Dropping zone
Dropping zone
Pavie track
Road 41
0 500 1000
yards
auxiliary airstrip
French perimeter
Isabelle
Gabrielle
March 15
Anne-Marie
Beatrice
March 13
Huguette
April 1
May 7
Dominique
Francoise
French strong points
March 30/31
Viet Minh assaults
April 12
Eliane
CHINA
Canton
Hong Kong
VIETNAM
Mandalay
Hanoi
South China Sea
Dien Bien Phu
BURMA
LAOS
Gulf of Tonkin
Rangoon
Bay of Bengal
THAILAND
0 m 300
0 km 500

Right: The choice of location for the camp is testimony to the over-confidence of the senior French commanders in Hanoi. The isolated post was overlooked by high ground on all sides, and was hopelessly overextended.

them, and one of their outposts (Beatrice) had fallen irrevocably. There were seven more of these outposts (Dominique, Eliane, Claudine, Françoise, Huguette, Anne-Marie and Gabrielle, all it was said named after de Castries' mistresses) and it soon became obvious that the separate and individual reduction of each outpost was Giap's first objective. As they were located beyond the range of any support except from the central position, and as the heavy artillery there had already been pounded almost into annihilation, this threw their defence entirely upon the individual outpost garrisons, varying between 500 and 2,000 men, each of which would face attacks by whole brigades.

Gabrielle was the next to go, despite the almost fanatical defence by the 5/7th Algerian Tirailleurs, despite also the solid construction of the outpost (considered the strongest of all) and the constant circling above it during the



In addition to its own guns, the camp was supposed to defend itself with a number of F8F Bearcat fighters but most of these were destroyed by Viet Minh shellfire. Once the airstrip was closed supplies could still be dropped, but the wounded could not be evacuated. Vastly outnumbered and out-gunned, the beleaguered garrison prepared to fight to the last.

Concealed in the jungle and supplied by innumerable peasant labourers, the Viet Minh artillery proved devastatingly effective, and immune to French countermeasures.

night by a 'flare ship', a Dakota dropping magnesium flares. By noon on 15 March Gabrielle was firmly in Viet Minh hands and Colonel Piroth, the artillery commander who had assured both the garrison at Dien Bien Phu and the command at Hanoi and Saigon that his guns would hold the enemy at bay with little difficulty, committed suicide in despair.

But despite Giap's anti-aircraft guns, on the following day C-47s arrived overhead and the 6th Colonial Parachute Battalion dropped in, as it happened just in time to take the places of the men of the 3rd T'ai battalion, who had decided to soldier no more and slipped off into the foothills; it was not their sort of battle, and certainly not their war.

During the next weeks the Viet Minh grip on Dien Bien Phu tightened implacably. Classic siege tactics were followed by Giap's men; trench lines were dug, forward saps run out ever closer to the next objective (on occasion underground to take mines), then one late evening a shattering bombardment would be followed by overwhelming infantry attack by waves of screaming and cheering riflemen. Dominique and Eliane were both partly overrun by the end of March, Huguette was taken but then retaken in a counterattack, and Isabelle was completely isolated from central command.

And the area under French control shrank all the time. On 1 April another company of colonial paratroops was dropped in together with some specialists, but the 105-mm shells and a lot of the mortar bombs fell into the appreciative hands of the Viet Minh gunners. By mid-April the garrison consisted of five parachute battalions, four of them well understrength, two weak Legion battalions and what was left of the Algerian and Moroccan battalions grouped together. The main perimeter was still some 9.6 km (6 miles) long, but it contained a hospital vastly overcrowded, nearly 2,000 prisoners, and about the same number of T'ai soldiers who were virtually deserters, as they refused to bear arms though they expected to be fed.

The garrison was also under new command as the 'parachute Mafia' of battalion commanders had decided between them that de Castries was not the man for the job, and had themselves taken over in a polite, bloodless but uncompromising coup.

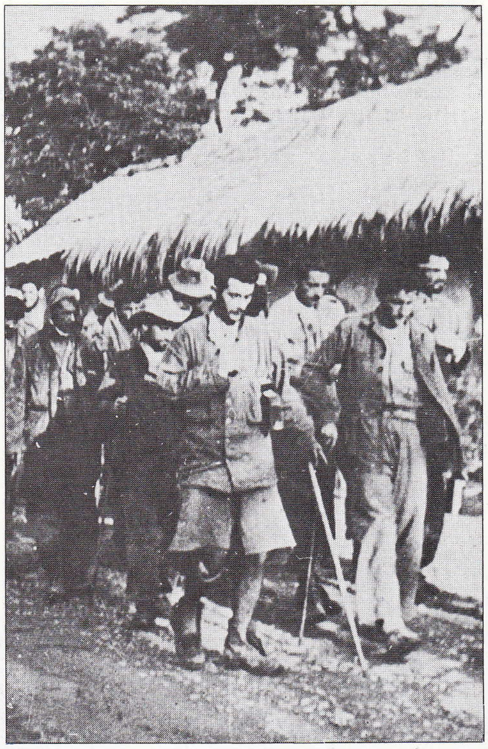
But even this measure could not prevail against the unyielding pressure of Giap's forces and the tactical disadvantages of Dien Bien Phu, and by early May it was obvious to all that the days of French defiance were almost over. An attempt by forces in Laos to drive to their relief was stopped dead, Dominique, Huguette and Eliane were yet further reduced, and the onset of the monsoon spelt even further erosion of strength through illness and attenuation of communication and supply. Despite this latter, however, C-47s and a couple of brand new Nord Noratlases arrived overhead on 3 May, though all that they managed to drop was one company of another Colonial parachute battalion.

Viet Minh bombardment

The end came on 7 May. Giap had brought up some Soviet-made Katyusha rocket-launchers, and these added devastating weight to the bombardment which crashed down on the evening of 6 May, continued through the night and by morning had reduced the French position to a few hundred square metres around the southern end of the airstrip. At noon, de Castries (still nominal commander) spoke to Cogny by radio and informed him that there were now barely 1,000 men still on their feet; and that afternoon Giap was informed that French firing would cease at 17.30.

So ended the battle of Dien Bien Phu. Giap allowed 900 of the worst wounded to be flown out, but the rest made up part of the 9,000 men who started out on what became known as the 'Death March'. None of the wounded who had suffered head, chest or stomach wounds ever came back, and not a very high proportion of even the unwounded. But most of the casualties of the battle lie still where they fell. As Bernard Fall, one of the best historians of the episode, has written:

'Most of the French dead are, like royalty, swathed in silk shrouds. Parachute nylon, like courage, was one of the commonest items at Dien Bien Phu, and on both sides.

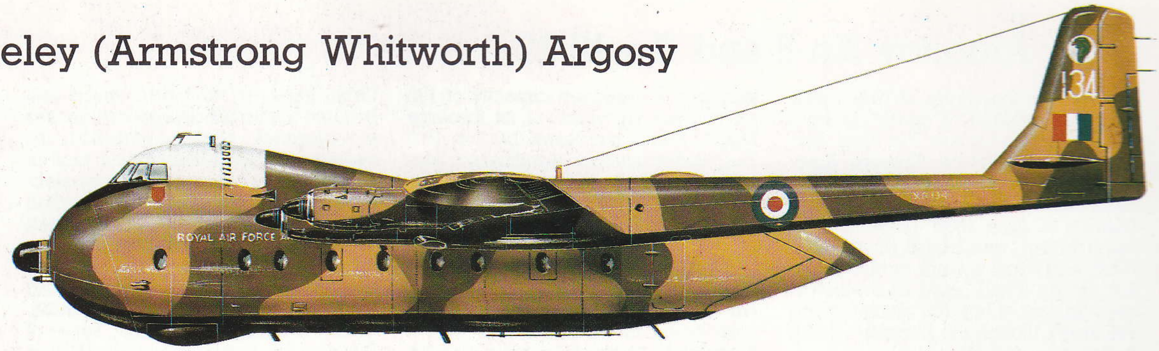


Above: The end for many of the heroic defenders of Dien Bien Phu came on the 'Death March' to POW camps hundreds of miles away. Nine hundred wounded were flown out after the surrender, but the rest of the survivors were herded through the jungle, deprived of food and medical care.

Left: Dien Bien Phu was occupied by the French on 20 November 1953, the hills in the background dominating the position chosen for the camp. Patrols leaving the camp soon encountered stiff resistance from the Viet Minh.

UK

Hawker Siddeley (Armstrong Whitworth) Argosy



A military specification dating from 1955 was used as the basis for the design of the large-capacity **A.W.650** commercial freighter, and it was from this that the **Armstrong Whitworth A.W.660 Argosy C.Mk 1** service transport was evolved, the prototype making its maiden flight on 6 March 1961. An initial order for the type numbering 56 for use by RAF Transport Command was placed soon afterwards, it being announced that the first squadron to receive the type would be No. 114 at Benson.

The new transport was in fact to bear a close resemblance to the civil machine since it incorporated 70 per cent of that aircraft's structure, although a major difference was in the fitting of clamshell rear-loading doors at the end of the central pod, the design being a four-motor, twin-boom high-wing type.

The loads which the Argosy could lift were impressive, and included a piece of light artillery, its trailer, and a 1-tonne truck. Other combinations were 69 fully-equipped troops or 48 stretcher cases with nursing orderlies. In addition the Argosy was adaptable as an inflight-refuelling tanker with a Mk 21 hose and drogue unit. It was thus small wonder that in 1959 the Argosy was being described as one of the most significant British aeroplanes produced in recent years.

After the first aircraft had been received for conversion training it became a common sight both at home and abroad, the type serving in MEAF and FEAF with Nos 70, 105, 114, 115, 215 and 267 Squadrons as a transport and a paratroop aircraft, being capable of taking 54 men in the latter role.

Argosies were not withdrawn until the mid-1970s, although a few remained for instrument calibration work. Before this they had seen action in the Malayan emergency when pressed into service with Blackburn Beverleys to supply British, Gurkha and Malaysian troops, work in which No. 215 Squadron figured prominently after it had been re-formed with the

***Above:** Developed from the Armstrong Whitworth 650 commercial freighter, the Argosy service transport incorporated a good proportion of the civil aircraft's structure. Making its maiden flight in 1961, the Argosy was used by the RAF in both the Middle and Far East.*

***Right:** The Argosy could carry 54 paratroops or 69 fully-equipped infantry; alternatively it could act as an inflight-refuelling tanker. In spite of its many capabilities, however, the Argosy fell victim to the spate of defence cuts of the late 1960s, and the aircraft was retired in the mid-1970s.*

Argosy at Benson before being posted to Changi, Singapore.

Specification

Argosy C.Mk 1

Type: military transport for troops, paratroops, motor transport or freight

Powerplant: four 1998-kW (2,680-hp) Rolls-Royce Dart 101 turboprops

Performance: maximum speed 463 km/h (288 mph) at 3048 m (10,000 ft); rate of climb 290 m (950 ft) per minute; service ceiling 6401 m (21,000 ft); range 3521 km (2,188 miles)

Weights: empty 25401 kg (56,000 lb); maximum take-off 46720 kg (103,000 lb)

Dimensions: span 35.05 m (115 ft 0 in); length 26.85 m (88 ft 1 in); height 8.23 m (27 ft 0 in); wing area 135.45 m^2 (1,458 sq ft)

UK

Short Belfast

The first **Short Belfast**, with the service serial XR362 in place of its original civil registration G-ASKE, made its maiden flight on 5 January 1964, flying from Sydenham to Aldergrove with a record take-off run of only some 914 m (1,000 yards). It thus proved itself an ideal freighter for operations where British army commitments, often calling for the movements of troops from ill-prepared ground, were being conducted in areas that were widely separated. In May of the same year a second aircraft flew, and at much the same time it was announced that orders had been placed for 10 **Belfast C.Mk 1** aircraft. It was envisaged that with its carrying capacity of some 200 armed men or perhaps three Saladin armoured cars, up to a maximum weight of 34927 kg (77,000 lb), fewer aircraft would have to be committed to any new Cyprus-type operation.

The final machine of this batch was delivered at the end of 1966 at a time when drag-reducing measures were being implemented on the design. Indeed it was these that delayed introduction of the first five to service, so that Belfast operations by No. 53 Squadron were forced to take place with partly modified machines in 1967; the fully-modified variants were not available until May of the following year;with retrospective change to all 10 scheduled for completion in 1969.

Production costs had been kept down by adhering to stringer and stressed-skin construction and its well-established principles as far as possible, and by using much of the Bristol Britannia's wing and tail unit. (Shorts had been responsible for as much as 40 per cent of this earlier aircraft's construction.) An interesting fact about the design's rather widely-spaced engines was that this layout was adopted in order that more powerful engines with larger-diameter propellers could be substituted at a later date.

The whole production run served with only a single squadron, and the Belfast's replacement in 1976 marked the passing of the first British aircraft designed from the outset for long-range military transport, its great size calling for a crew of four in addition to an air quartermaster.

Specification

Belfast C.Mk 1

Type: strategic military transport

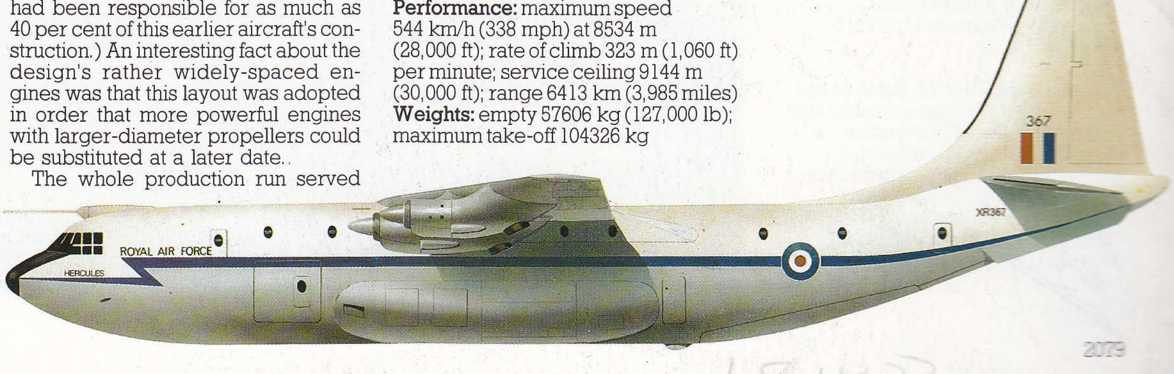
Powerplant: four 4273-kW (5,730-hp) Rolls-Royce Tyne RTy. 12 Mk 101 turboprops

Performance: maximum speed 544 km/h (338 mph) at 8534 m (28,000 ft); rate of climb 323 m (1,060 ft) per minute; service ceiling 9144 m (30,000 ft); range 6413 km (3,985 miles)

Weights: empty 57606 kg (127,000 lb); maximum take-off 104326 kg (230,000 lb)

Dimensions: span 48.40 m (158 ft 9.5 in); length 41.58 m (136 ft 5 in); height 14.33 m (47 ft 0 in); wing area 229.09 m^2 (2,466 sq ft)

The Short Belfast was the most capable heavy transport ever operated by the RAF, and the decision to retire it in the mid-1970s was shown to be shortsighted when the need for heavy lift became vital in the Falklands.



USSR

Antonov An-8 and An-10/12

Designed in the winter of 1952-3 as a transport capable of operating from short airstrips in the Far East and Siberia, the prototype **Antonov An-8**, or **'Camp'** as it was known to NATO, received its first public showing at Tushino in June 1956. However, nothing further was heard of it in the West, and reports were in circulation that the An-8 had failed its evaluation tests. In fact about 100 aircraft were delivered, though the Kuznetsov NK-6 powerplant was immature.

Obviously based on the earlier type but now with four motors, the **An-10 'Cat'** made its debut as a civil transport at Vnukovo Airport, Moscow, in July 1957. Shortly afterwards the **An-10A** made its appearance, this being a version with a maximum capacity of 130 passengers by virtue of its fuselage length being increased by 2 m (6 ft 7 in), and structurally significant in having a prominent ventral fin and two auxiliary surfaces on the tailplane, and in this version, the An-10A followed the An-10 into service with Aeroflot.

Meanwhile, a military cargo variant was developed under the designation **An-12**, its absence of additional fin area being of note, together with a completely redesigned rear fuselage which, inclined sharply upwards, terminated in a tail gunner's position and incorporated a ramp to facilitate loading. The type was soon dubbed **'Cub'** by NATO. The West's first sight of the military version of the An-12 was at Orly, Paris, in mid-1960 when one brought the Soviet delegation's cars to a conference, while examination revealed such refinements as a built-in rear gantry and facilities for dispatching a load of 100 paratroops in less than one minute. Total production has been in excess of 1,000 machines since the type has been used not only by the countries of the Warsaw Pact, but also by Algeria, Bangladesh, Egypt, India, Indonesia, Iraq and Poland, some of these being distinguished by a fairing under the nose to house weather and mapping radar. Maximum payload is 20 tonnes.

Specification
An-12
Type: military freight and paratroop transport
Powerplant: four 4,000-ehp (2983-kW) Ivchenko AI-20K turboprops
Performance: maximum speed 777 km/h (482 mph) at 6000 m (19,685 ft); climb rate 600 m (1,970 ft) per minute; service ceiling 10200 m (33,465 ft); range 3600 km (2,237 miles)
Weights: empty 28000 kg (61,728 lb); maximum take-off 61000 kg (134,480 lb)
Dimensions: span 38.00 m (124 ft 8 in); length 36.85 m (121 ft 3 in); height 9.8 m (32 ft 3 in); wing area 119.5 m^2 (1,286.3 sq ft)
Armament: power-operated tail position with two 23-mm NR-23 cannon

---

USSR

Ilyushin Il-12 and Il-14

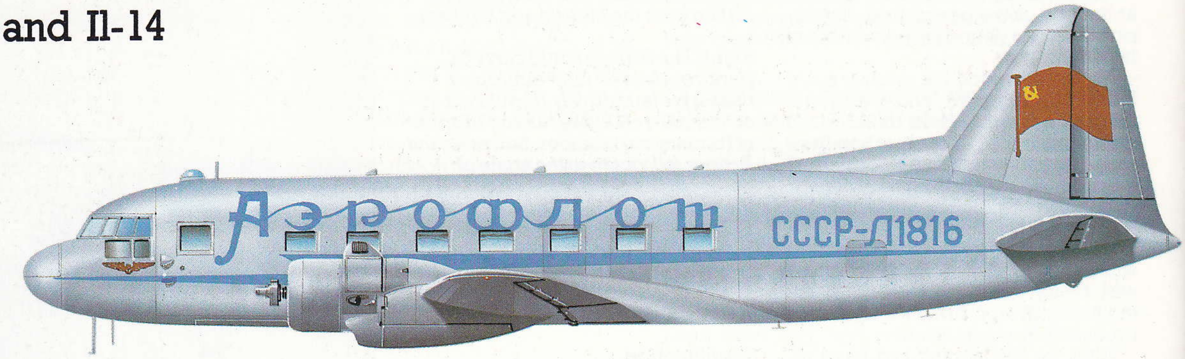
Known to NATO as **'Coach'**, the **Ilyushin Il-12** was the USSR's first post-war production transport, the prototype making its maiden flight in 1945. The Il-12's development, the **Il-14** 'Crate', did not make its first appearance until 1953, and both types were conceived as medium-range transport aircraft.

With a crew of three, the Il-12 was capable of taking a maximum of 32 men, and like the later model could be easily converted to carry either freight or a maximum of 32 paratroops, the Il-14 having space for 40 of these and an additional crew member. Some 3,000 examples of the Il-12 were built for service not only with the Soviet forces but also with those of Czechoslovakia, China and Poland.

The later machine was an aerodynamically refined version of the earlier type, incorporating a completely new wing design, and a fin and rudder that now boasted a flatter top line, although the tricycle landing gear was similar on both.

Originally seen as a replacement for the Soviet versions of the Douglas DC-3, the success of both these Ilyushins may be judged from the fact that, discounting the versions in use by Aeroflot, no less than 6,500 examples of both types were produced, including about 3,000 of the earlier variant. In addition to those in use by the country of origin, Il-14s were also flown in the colours of China, Czechoslovakia, East Germany, Egypt, the United Arab Republic, the Congo, India, Indonesia, Poland and Yugoslavia, while at the same time the Georgi Dimitrov works at Letnany in Czechoslovakia was turning out its own version known as the **Avia-14-32A**. East Germany also manufactured about 100 in addition to those supplied by the USSR.

Specification
Il-12/14
Type: medium-range military transport with accommodation for troops or freight



An Il-12 in Aeroflot colours. As with all Soviet civil aircraft, it would have been subordinate to any Soviet military requirement.

Powerplant: (Il-12) two 1,850-hp (1380-kW) Shvetsov ASh-82FNV radial piston engines, or (Il-14) two 1,900-hp (1417-kW) Shvetsov ASh-82T radial piston engines
Performance: (Il-12) maximum speed 407 km/h (253 mph) at 2500 m (8,200 ft); climb to 5000 m (16,404 ft) in 15 minutes; service ceiling 6500 m (21,325 ft); range 1500 km (932 miles)
Performance: (Il-14) maximum speed 430 km/h (267 mph) at 2400 m (7,875 ft); climb to 5000 m (16,404 ft) in 9 minutes 30 seconds; service ceiling 7400 m (24,278 ft); typical range 1500 km (932 miles) with 26 passengers
Weights: (Il-12) empty 11045 kg (24,350 lb); maximum take-off 17250 kg (38,029 lb)
Weights: (Il-14) empty 12080 kg (26,631 lb); maximum take-off 17250 kg (38,029 lb)
Dimensions: (Il-12) span 31.70 m (104 ft 0 in); length 21.31 m (69 ft 11 in); height 8.07 m (26 ft 6 in); wing area 103.00 m^2 (1,109 sq ft)
Dimensions: (Il-14) span 31.70 m (104 ft 0 in); length 21.31 m (69 ft 11 in); height 7.90 m (25 ft 11 in); wing area 100.0 m^2 (1,076 sq ft)

PRZEDSIEBIORSTWO
USŁUG LOTNICZYCH
AEROPOL
SP-LNB

Evolved from the Il-12, the Il-14 can be regarded as an aerodynamically improved version of the older aircraft. The new tail is most noticeable, but less obvious is the improved wing. Intended as a replacement for the ubiquitous DC-3 (built in the USSR as the Li-2), the Ilyushin designs were built in some numbers.